OCT 19 1916
UNIV. OF MICH. LIBRARY

**HEATING AND LIGHTING NUMBER.**

# THE BUILDER

## A RECORD OF ARCHITECTURE & CONSTRUCTION

VOLUME CXI. No. 3843.
*Seventy-fourth Year.*
Telephone: Regent 5940.

FRIDAY, SEPTEMBER 29, 1916.
REGISTERED AT THE GENERAL POST OFFICE AS A NEWSPAPER.

PRICE FOURPENCE.
*By Post, 5d. (This Week.)*
Telegrams: The Builder, London.

**SIMPLEX LEAD GLAZING**
FOR ROOFS, SKYLIGHTS, and HORTICULTURAL WORK.
NO ZINC, IRON, or PUTTY USED.
ANY QUANTITY SUPPLIED.
NO SPECIAL CONTRACT REQUIRED.
Over 2,000,000 sup. ft. in use.
Write for Particulars to—
**GROVER & CO., LIMITED,**
Britannia Engineering Works, Carpenters Road, Stratford, E.
FACTORIES AND GENERAL ENGINEERS.

**TWO STOVES IN ONE.**
THE "INTEROVEN." (COPYRIGHT.)
*The only Reliable Convertible Stove.* [See page xvi.

**HYDRAULIC LIFTS.** PUSH BUTTON CONTROL.
LONDON HYDRAULIC POWER CO., HATFIELD STREET, S.E.

**WAYCOOD-OTIS LIFTS.**
ELECTRIC. FALMOUTH ROAD, S.E.

**HASKINS**
"CITY 2985" (4 lines).
For Lifts, Shop-Fronts, Revolving Shutters, Sun Blinds, Iron Gates, Etc.
SAML. HASKINS & BROS., LTD., 20/34, OLD ST., E.C.

**ASPHALTE.** T.N.: 2944 Central.
THE SEYSSEL AND METALLIC LAVA ASPHALTE CO. (Mr. H. GLENN). Offices: 42, POULTRY, E.C.
ASPHALTE CONTRACTORS TO THE FORTH BRIDGE CO.
[See other Advt. last page of literary matter.

**MUNITION FACTORIES**
VENTILATORS & AIR DUCTS
provided and fitted.
*Sketches and details on application.*
**EWART & SON, Ltd., Euston Rd., London.**

**ASTON CONSTRUCTION CO., LONDON, N. Ltd.**
ASTON STEELWORK.
ASTON IRON STAIRCASES.
ASTON HOLLOW TILE FLOORS.
ASTON NORTH 1808 (3 lines).

**"POILITE" ASBESTOS-CEMENT ROOFING TILES. BUILDING SHEETS.**
TRADE MARK Poilite
Permanent—Economical—Light—Effective—Fireproof.
"POILITE" is made at Harefield, near London.
Used by War Office, Admiralty, and all British Government Departments.
OVER 70,000,000 (seventy million) SQUARE FEET of "POILITE" HAVE ALREADY BEEN SUPPLIED TO THE WAR DEPARTMENT FOR ARMY HUTMENTS, HOSPITALS, MUNITION FACTORIES, Etc.
**BELL'S UNITED ASBESTOS Co., Ltd., Southwark Street, S.E.**

"MAILON" NON-INFLAMMABLE
**BITUMEN SOLUTION.**
**VULCANITE, LTD.** LONDON: 118, Cannon St., E.C. BELFAST: Laganvale. MANCHESTER: Westinghouse Trafford Park.

**BOYLE'S LATEST PATENT "AIR-PUMP" VENTILATOR**
Has double the extracting power of earlier forms and is one-half the price.
**ROBERT BOYLE & SON,**
64, HOLBORN VIADUCT, LONDON, E.C.

**VAN KANNEL CO., Ltd., REVOLVING DOORS.**
62, New Broad St., E.C. AND Cassiobury Mills, WATFORD.

**STEEL JOISTS**
Large and Varied Stock Kept.
**FLEMING BROS.**
*Constructional Engineers.*
*Apply*—65, Bath Street, GLASGOW.
*Free on application, New Pocket Section Book.*

**THE BRITISH ARCHITECT**
A MONTHLY JOURNAL OF ARCHITECTURE AND ITS ACCESSORY ARTS.
September issue (New Monthly Series) NOW ON SALE } PRICE 3d.
SPECIMEN COPY AND SUBSCRIPTION RATES FREE ON APPLICATION TO THE PUBLISHER.
THE BRITISH ARCHITECT, 4, Catherine Street, Covent Garden, W.C.

# Analysis of Advertisements.

For Alphabetical List of Firms appearing in this List and References to current Advertisements see Opposite page.

**Art Metal Fittings :—**
Art Metal Construction Co. Ltd.

**Asbestos Tiles and Sheets :—**
Bell's United Asbestos Co. Ltd.

**Asphalte :—**
Claridge's Asphalte Co. Ltd.
Engert & Rolfe, Ltd.
Faido, T. & Co. Ltd.
Hobman, A. C. W. & Co. Ltd.
Limmer Asphalte Paving Co.
Ragusa Asphalte Co. Ltd.
Seyssel & Metallic Lava Ashpalte Co.
Val de Travers Asphalte Co.
Vulcanite, Ltd.

**Beaver Board :—**
Beaver Board Co. Ltd.

**Bells, &c. :—**
Carr, Chas. Ltd.

**Bitumen Sheeting :—**
Callender, Geo. M. & Co. Ltd.
McNeill, F. & Co. Ltd.
Vulcanite, Ltd.

**Blind Cords :—**
Anchor Brand.

**Blinds (Window, &c.) :—**
Bryden, John, & Sons
Francis, S. W. & Co. Ltd.
Haskins, S. & Bros.
Williams, G. A. & Son

**Boiler and Economiser Settings :—**
Chimneys, Ltd.

**Bricks :—**
Builders' Material Association.
Bursey, C. Ltd.
Dennis, Henry
Doulton & Co. Ltd.
Leeds Fireclay Co. Ltd.
Rufford & Co.
Smeed, Dean, & Co. Ltd.

**Brushes :—**
Builders' Material Association
Nicholls & Clarke
Young & Marten, Ltd.

**Builders' Brasswork :—**
Builders' Material Association
Francis, S. W. & Co. Ltd.
Haskins, S. & Bros. Ltd.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Builders' Ironmongery :—**
Colledge & Bridgen
Nicholls & Clarke
Young & Marten, Ltd.

**Building Composition :—**
Callender, Geo. M. & Co. Ltd.
Calno Board
Thames Paper Co.

**Building Contractors :—**
Building Construction Co.

**Castings :—**
Haywards, Ltd.
Nicholls & Clarke, Ltd.
Thames Bank Iron Co. Ltd.
Young & Marten, Ltd.

**Cement, Lime, Plaster, &c. :—**
Associated Portland Cement Manufacturers (1900), Ltd.
British Portland Cement Manufacturers, Ltd.
Builders' Material Association
Burley, C. Ltd.
Greaves, Bull, & Lakin
Kaye & Co. Ltd.
Smeed, Dean, & Co. Ltd.
Wouldham Cement Co. Ltd.

**Cement Waterproofer :—**
Builders' Material Supply Association
Kerner-Greenwood & Co. (Pudlo).

**Chimney Cowls, &c. :—**
Kwart & Son, Ltd.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Chimney Pieces (Marble), &c. :—**
Nicholls & Clarke, Ltd.
Sessions & Sons, Ltd.
Young & Marten, Ltd.

**Chimney Shafts :—**
Chimneys, Ltd.
Furse, W. J.

**Coatertone :**
Stone Preservation Co.

**Composition Flooring :**
Turpin's Parquet Floor, Joinery, and Woodcarving Co.

**Concrete (Reinforced) :—**
British Reinforced Engineering Co. Ltd.
Expanded Metal Co. Ltd.
King, J. A. & Co.

**Concrete Piling :—**
Simplex Concrete Piles, Ltd.

**Contractors' Plant :—**
Builders' Material Association
Lewis & Lewis, Ltd.
Palmer's Travelling Cradle and Scaffold Co.
Parker, F. & Co.
Stephens & Carter

**Cooking Apparatus :—**
Benham & Sons, Ltd.
Davis Gas Stove Co.
Nicholls & Clarke, Ltd.
Norris, F. A. & Co.
Potterton, T.
Summerscales, W. & Sons
Young & Marten, Ltd.

**Damp Proof Courses :—**
Callender, Geo. M. & Co. Ltd.
Doulton & Co. Ltd.
Engert & Rolfe, Ltd.
Hobman, A. C. W. & Co. Ltd.
Ironite Co. Ltd. (The)
Kerner-Greenwood & Co.
McNeill, F. & Co. Ltd.
Ragusa Asphalte Co. Ltd.
Rogers, Welch, & Co. Ltd.
Seyssel and Metallic Lava Asphalte Co.
Vulcanite, Ltd.

**Doors (Iron, Steel, &c.) :—**
Dennison, Kett, & Co. Ltd.
Gibson, A. L. & Co.
Haywards, Ltd.
Hobbs, Hart, & Co. Ltd.
Lift and Hoist Co.

**Door Hangers :—**
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Door Springs and Hinges :—**
Colledge & Bridgen
Nicholls & Clarke, Ltd
Young & Marten, Ltd.

**Electric Lamps :—**
British Thomson-Houston Co. Ltd.

**Electric Light Fittings :—**
Tredegars, Ltd.

**Electric Lighting :—**
Tredegars, Ltd.

**Electric Motors :—**
British Thomson-Houston Co. Ltd.
Mather & Platt, Ltd.

**Electricity :—**
British Thomson-Houston Co. Ltd.
Croggon & Co. Ltd.
Mather & Platt, Ltd.
Tredegars, Ltd.

**Endless Cords for Fanlight Openers :—**
Anchor Brand.

**Engines, Mortar Mills, &c. :—**
Lewis & Lewis, Ltd.

**Facias, &c. :—**
Francis, S. W. & Co. Ltd.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Felt :—**
Anderson, D. & Son, Ltd.
Engert & Rolfe, Ltd.
Gibson, A. L. & Co.
McNeill, F. & Co. Ltd.

**Fencing (Wood &c.) :—**
Darlington Fencing Co.
Rowland Bros.

**Fiberlic Board :—**
MacAndrews & Forbes, Ltd.

**Fire Cements :—**
Builders' Material Supply Association

**Fire Escapes, Staircases :—**
Clark, Hunt, & Co. Ltd.
Davis, H. & C. & Co. Ltd.
Haywards, Ltd.
Lift and Hoist Co.

**Fire Protection Equipment :—**
Art Metal Construction, Ltd.
Mather & Platt, Ltd.

**Fire-Resisting Glazing :—**
British Luxfer Prism Syn
Haywards, Ltd.
King, J. A. & Co.

**Fireproof Flooring, &c. :—**
Bell's United Asbestos Co. Ltd.
Dawnay, A. D. & Sons, Ltd.
Expanded Metal Co. Ltd.
Haywards, Ltd.
Ironite Co. Ltd.
King, J. A. & Co.
Kleine Pat. Flooring Co. Ltd.
The Siegwart Fireproof Floor Co. Ltd.

**Flint Paper :—**
Oakey, J. & Sons, Ltd.

**Floor Hardener :—**
Turpin's Parquet Floor, Joinery, and Woodcarving Co.
True-Con Laboratories

**Flooring and Paving :—**
Acme Paving and Flooring Co. (1904), Ltd.
British Doloment Co. Ltd.
Ironite Co. Ltd.
Stevens & Adams
Turpin's Parquet Floor, Joinery, and Woodcarving Co.

**Folding Partitions :—**
Lift and Hoist Co.

**Furnace Builders :—**
Chimneys, Ltd.

**Garden Hose :—**
Wilcox, W. H. & Co. Ltd.

**Gates (Collapsible) :—**
Dennison, Kett, & Co. Ltd.
Haywards, Ltd.
Lift and Hoist Co.

**Gates, Railings (Iron), &c. :—**
Bayliss, Jones, & Bayliss, Ltd.
Haywards, Ltd.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Glass (Plate and Window :—**
Farmiloe, G. & Sons, Ltd.
Haywards, Ltd.
Jennings, C. & Co. Ltd.
King, J. A. & Co.
Newton, J. M. & Sons, Ltd.
Nicholls & Clarke
Young & Marten, Ltd.

**Glass Paper, Emery Wheels :—**
Oakey, J. & Sons, Ltd.

**Glass (Stained, Painted, &c.) :—**
Clark, J. & Son
Farmiloe, G. & Sons, Ltd.
Haywards, Ltd.
King, J. A. & Co.
Newton, J. M. & Sons, Ltd.
Nicholls & Clarke
Young & Marten, Ltd.

**Glazing :—**
Braby, F. & Co. Ltd.
Grover & Co. Ltd.
Haywards, Ltd.
Helliwell & Co. Ltd.
King, J. A. & Co.
Newton, J. M. & Sons, Ltd.
Nicholls & Clarke, Ltd.
Partridge, T. & Co.
Young & Marten, Ltd.

**Glue (Liquid) :—**
Improved Liquid Glues Co. Ltd.

**Heating and Lighting :—**
Benham & Sons, Ltd.
British Commercial Gas Association
Chimneys, Ltd.
Clark, Hunt, & Co. Ltd.
Davis Gas Stove Co.
Ewart & Son, Ltd.
Fletcher, Russell, & Co. Ltd.
Hartley & Sugden, Ltd.
Haywards, Ltd.
Keith, J. & Blackman Co. Ltd.
King, J. A. & Co.
Messenger & Co.
Musgrave & Co.
Nicholls & Clarke, Ltd.
Norris, F. A. & Co.
Potterton, T.
Shorland, H. H. & Bro. Ltd.
Thames Bank Iron Co. Ltd
Tredegar & Co.
Young & Marten, Ltd.

**Horticultural Buildings :—**
Messenger & Co.

**Hydraulic Power :—**
London Hydraulic Power Co.

**Industrial Motor Vehicles**
"Motor Traction"

**Insurance :—**
London and Lancashire Fire Insurance Co. Ltd.
Norwich Union

**Ironite :—**
Ironite Co. Ltd

**Joinery, Mouldings, &c. :—**
Bryce, White, & Co.
Jennings, C. & Co. Ltd.
Ogilvie & Co.
Orfeur, C. R. Ltd.
Sessions & Sons, Ltd.
Tucker, W. Duncan, & Sons
Turpin's Parquet Floor, Joinery, and Woodcarving Co.

**Ladders :—**
Builders' Material Association
Heathman & Co.
Parker & Co.
Stephens & Carter

**Laundry Appliances :—**
Bradford, T. & Co. Ltd.
Summerscales, Ltd.

**Lead, Oil, Colours, Size, &c. :—**
Builders' Material Association
Farmiloe, G. & Sons, Ltd.
Girdler J. & Co.
Nicholls & Clarke
Young & Marten, Ltd.

**Letters, &c. :—**
Francis, S. W. & Co. Ltd.

**Lifts, Hoists, Cranes, &c. :—**
Bryden, John, & Sons
Dennison, Kett, & Co. Ltd.
Evinrude Motor Co. (Eng.) Ltd.
Haskins, S. & Bros. Ltd.
Lewis & Lewis, Ltd.
Lift and Hoist Co.
Stevens, A. & F.
Titan Lift Co. Ltd.
Waygood-Otis, Ltd.

**Lightning Conductors :—**
Anderson, R. & Co.
Croggon & Co. Ltd.
Furse, W. J.

**Lithography :—**
Allday, Ltd.

**Locks, Latches, and Furniture :—**
Colledge & Bridgen
Hobbs, Hart, & Co. Ltd.
Nicholls & Clarke, Ltd.
Shaw & Carter, Ltd.
Young & Marten, Ltd.

**Marble :—**
Moore, M. & R.

**Metal Casements :—**
Haywards, Ltd.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Mill Mortar :—**
Builders' Material Association

**Mosaic Work :—**
Boote, T. & R. Ltd.
Cope & Co.
Maw & Co. Ltd.
Moore, M. & R.
Stevens & Adams
Turpin's Parquet Floor, Joinery, and Woodcarving Co.

**Mouldings :—**
Jennings, C. & Co.
Tucker, W. Duncan. & Sons

**Paints, Stains, Varnish, &c. :—**
Builders' Material Association
Clark, Robert Ingham, & Co.
Farmiloe, G. & Sons, Ltd.
Farmiloe, T. & W. Ltd.
Nicholls & Clarke
Stephens, H. C.
Young & Marten, Ltd.

**Parquet Flooring :—**
Anglo (All British) Parquet Co.
Bassant, H. & Co.
Cambridge Wood Block and Parquetry Co. Ltd.
Damman & Co.
Stevens & Adams
Turpin's Parquet Floor, Joinery, and Woodcarving Co.

**Partitions, Slabs, &c. :—**
Beaver Board Co. Ltd.
British Uralite Co. (1909)
Builders' Material Association
Expanded Metal Co. Ltd.
Jones, Fredk. & Co. Ltd.
King, J. A., & Co.
MacAndrews & Forbes, Ltd.
Muribloc (Partition Slabs), Ltd.

**Pavement, &c., Lights :—**
Haywards, Ltd.
King, J. A. & Co.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Picture Cords :—**
Anchor Brand.

**Pumps, Pumping Engines, &c.**
Braby, F. & Co. Ltd.
Mather & Platt, Ltd.
Nicholls & Clarke, Ltd.
Phœnix Engineering Co. Ltd.
Pulsometer Engineering Co.
Wilcox, W. H. & Co. Ltd.

**Rain-Water Heads and Pipes :—**
Builders' Material Association
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Roofing (Felt) :—**
Anderson, D. & Son, Ltd.
McNeill, F. & Co. Ltd.
Seyssel and Metallic Lava Asphalte Co.

**Roofing (Rok) :—**
Anderson, D. & Son

**Roofing (Ruberoid) :—**
Ruberoid Co. Ltd. (The)

**Roofing (Vulcanite) :—**
Vulcanite, Ltd.

**Rooflights :—**
Messenger Bros. Ltd.

**Roof Repairing Compound :—**
Farmiloe, T. & W. Ltd.

**Roofs (Zinc and Copper) :—**
Braby, F. & Co. Ltd.
Kwart & Son, Ltd.

**Roofs and Buildings (Iron and Steel) :—**
Croggon & Co. Ltd.
Findlay, A. & Co. Ltd.
Haywards, Ltd.
Shaw, M. T. & Co.

**Safes :—**
Hobbs, Hart, & Co. Ltd.
Tann, John, Ltd.

**Sanitary Appliances and Ware :—**
Andrew & Nanson
Builders' Materia Association
Burn Bros.
Dennis, Henry
Doulton & Co. Ltd.
Farmiloe, G. & Sons, Ltd.
Haywards, Ltd.
Leeds Fireclay Co. Ltd.
Nicholls & Clarke
Rufford & Co.
Sessions & Sons, Ltd.
Thames Bank Iron Co. Ltd.
Young & Marten, Ltd.

**Sash Lines, Cords, &c. —**
Anchor Brand

**Scaffolding :—**
Builders' Material Association
Humphries Patent Bracket & Scaffold Syndicate, Ltd.
Palmer's Travelling Cradle and Scaffold Co.
Parker, F. & Co.
Patent Rapid Scaffold Tie Co.
Stephens & Carter

**Shop Fronts (Metal and Wood) :—**
Francis, S. W. & Co. Ltd.
Haskins, S. & Bros. Ltd.
Jennings, C. & Co.

**Shutters :—**
Dennison, Kett, & Co.
Francis, S. W. & Co. Ltd.
Gibson, A. L. & Co.
Haskins, S. & Bros. Ltd.
Lift and Hoist Co.

**Signs :—**
Francis, S. W. & Co. Ltd.

**Silicate Cotton :—**
Jones, F. & Co. Ltd.
McNeill, F. & Co. Ltd.

**Slag Wool :—**
Jones, Fredk. & Co. Ltd.
McNeill, F. & Co. Ltd.

**Slates :—**
Builders' Material Association
Ettridge, J. J. Junr.
Sessions & Sons, Ltd.

**Slating and Tiling :—**
Ettridge, J. J. Junr.

**Sprinklers (Automatic) :—**
Mather & Platt, Ltd.

**Stable, &c., Fittings :—**
Haywards, Ltd.
Musgrave & Co. Ltd.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Stair Treads :—**
Hughes, Bolckow, & Co. Ltd.
Safety Tread Syndicate, Ltd.

**Staircases, Verandahs, &c. :—**
Art Metal Construction, Ltd.
Aston Construction Co.
Carron Company
Davis, H. & C. & Co.
Haywards, Ltd.
Lift and Hoist Co.
Nicholls & Clarke, Ltd.
Young & Marten, Ltd.

**Stone :—**
Bath and Portland Stone Firms, Ltd.
Pawson Bros. Ltd.
Yockney and Hartham Park Stone Co. Ltd.

**Stone Preservative. :—**
Bath and Portland Stone Firms, Ltd.
Stone Preservation Co.
Tribe & Co.

**Storage Bins (Steel) :—**
Gibbons, James
Sankey, J. & Sons

**Stoves, Ranges, Mantels, &c. :—**
Candy & Co. Ltd.
Carron Company
Doulton & Co. Ltd.
Interoven Stove Co. Ltd.
Nicholls & Clarke, Ltd.
Sessions, J. & Sons
Musgrave & Co.

**Stoves, Ranges, &c. (Cont.) :—**
Shorland, H. H. & Bro. Ltd.
Young & Marten, Ltd.

**Strong Rooms :—**
Hobbs, Hart, & Co. Ltd.
Tann, John, Ltd.

**Structural Iron and Steel :—**
Anton Construction Co.
Brunswick Engineering Co.
Clark, Hunt, & Co. Ltd.
Davis, H. & C. & Co.
Dawnay, A. D. & Sons, Ltd.
Freeman's
Haywards, Ltd.
Henderson & Glass
Lift and Hoist Co.
Shaw, M. T. & Co.

**Surveying Instruments :—**
Clarkson's

**Tanks, Cisterns, &c. :—**
Braby, F. & Co.
Builders' Material Association
Croggon & Co. Ltd.
London Galvanised Iron Co.
Mather & Platt, Ltd.
Nicholls & Clarke, Ltd.
Shaw, M. T. & Co.
Thames Bank Iron Co. Ltd.
Young & Marten, Ltd.

**Tar Boilers :—**
Phœnix Engineering Co. Ltd.

**Terra Cotta :—**
Dennis, Henry
Doulton & Co. Ltd.
Leeds Fireclay Co. Ltd.
Term-Cotta Co.

**Tiles :—**
Boote, T. & R. Ltd.
Cope & Co.
Dennis, Henry
Doulton & Co. Ltd.
Leeds Fireclay Co. Ltd.
Maw & Co. Ltd.
Minton, Hollins, & Co.

**Timber :—**
Bryce, White, & Co.
Gliksten, G. & Son, Ltd.
Jennings, C. & Co. Ltd.
Priday, Sydney (Oak)
Sessions & Sons, Ltd.
Young & Marten, Ltd.

**Timber Preservative :—**
Anderson, D. & Son

**Time Recorders :—**
National Time Recorder Co.

**Tyres :—**
Dunlop Rubber Co.
North British Rubber Co.

**Underlining, &c. :—**
Engert & Rolfe, Ltd.
McNeill, F. & Co. Ltd.
Vulcanite, Ltd.

**Ventilating :—**
Keith, J. & Blackman Co.
Boyle, R. & Son
Clark, J. & Son
Ewart & Son, Ltd.
Haywards, Ltd.
Norris, F. A. & Co.
Shorland, H. H. & Bro. Ltd.

**Wall and Ceiling Coverings :—**
Macandrews & Forbes.
Nicholls & Clarke
Thames Paper Co.
Young & Marten, Ltd.

**Water Hard :—**
Clark, Hunt, & Co. Ltd.

**Water Heaters :—**
Ewart & Son, Ltd.
Potterton, T.

**Waterproofing :—**
Callender, G. M. & Co. Ltd.
Ironite Co. Ltd.
Kerner-Greenwood & Co. (Pudlo).
Rogers, Welch, & Co. Ltd.
Tribe & Co.
Trus-Con Laboratories
Vulcanite, Ltd.

**Water Towers :—**
Chimneys, Ltd.

**Window Frames and Sashes :—**
Braby, F. & Co. Ltd.
Brunswick Engineering Co.
Carron Company
Clark, Hunt, & Co. Ltd.
Hayward Bros. & Ecketein
Young & Marten, Ltd.

**Window Guards :—**
Lift and Hoist Co.

**Wine Bins (Iron) :—**
Farrow & Jackson

**Wiring :—**
Tredegars, Ltd.

**Wire Rope :—**
Palmer's Travelling Cradles Co.

**Wood Electric Fittings :—**
Tredegar & Co. Ltd.

**Wood Flooring :—**
Acme Flooring and Paving Co. (1904) Ltd.
Anglo (All British) Parquet Co.
Bassant, H. & Co.
Jennings, C. & Co.
Stevens & Adams
The Zeta Wood Flooring Co.
Turpin's Parquet Floor, Joinery, and Woodcarving Co.

**Wood Working Machinery :—**
Lewis & Lewis, Ltd.
Reynolds, F. W. & Co.


**SESSIONS & SONS, Ltd.,**
**GLOUCESTER.**
***Builders' Requisites of Every Description.***
*WRITE OR WIRE FOR QUOTATIONS.*

THE **HELLIWELL**
"PERFECTION" SYSTEM
**PATENT GLAZING.**
Works: BRIGHOUSE, YORKS.
London Office: 11, VICTORIA ST., WESTMINSTER, S.W.

# THE BUILDER

*A RECORD OF ARCHITECTURE AND CONSTRUCTION.*

VOL. CXI.—No. 3843. SEPTEMBER 29, 1916.

## THE CONDITIONS OF LABOUR.

THE nineteenth century, considered in the perspective of time, will appear to be an age of materialism by comparison with the centuries which preceded it, and we hope also by comparison with the centuries which lie hidden in the depths of the future. The downfall of the first French Empire saved Europe from falling under a tyranny; but the era of Napoleon was born amid a wealth of aspiration to which the French Revolution gave emphasis. Though all men could not be "free and equal," the Revolution broke the chains of prejudice and caste which prevented men from rising out of the misery and penury to which they had been born heirs; and, though a great social rising ended in the establishment of a despotism which caused twenty-five years of war, the whole of Europe benefited in many ways by the epoch of upheaval.

But the rise of industrialism and an inordinate pursuit of wealth to be gained thereby taught civilised Europe to think in terms of money. Both in our own and other countries the record of last century is far from being an ennobling one, and we are to-day paying the penalty for allowing the most materialistic State the world has ever seen to despoil her neighbours and create a power which has menaced the civilised world. The sanctity of Treaty rights for which we are fighting was sacrificed when we allowed Prussia to despoil Denmark, and by acquiescing in the annexation of French soil in 1870 we gave our enemy of to-day the power to procure iron for the armaments now used against the Allies. We have, to use commercial terms, allowed a debt to accumulate which we must repay with enormous interest, because generations in the nineteenth century determined to have peace at any price. The doctrine of respect for racial rights now much discussed is no new one, and has over and over again been the cause of wars; but Italy owed her regeneration as a nation to the jealousies of rival Powers by whom she was used as a pawn in a larger game; while the Balkan States and Greece might have been parts of the Turkish Empire to-day had Turkey been a military power.

Similarly the amelioration of the conditions of labour owed its origin in a measure to the growing conviction that bad conditions are economically unsound rather than to the wish that all should have a measure of justice.

What those conditions were has probably never been stated more forcibly than in Zola's great work "Germinal," which describes life in the colliery districts of France at some period anterior to 1884, when the work was written, and shows how the resources of civilisation can be used to produce a system of the worst slavery. The effect of unchecked industrial enterprise is also vividly pictured in "The Jungle" and "The Metropolis," which deal with American industrial conditions. Sinclair's books are coloured by his Socialistic beliefs, but the strength of Zola's works lies in his rigid avoidance of bias and the immense pains he always took to obtain his facts from life. But the books we have mentioned will be read in future ages with wonder that society could ever have tolerated such enormities, involving as they do callousness to human suffering, unrelieved by the gorgeous picturesqueness which brightened some of the worst epochs of past ages.

It is opportune at a time which may be described as being one of national stocktaking that a book relating the growth of the movement for improving the condition of the workers should be brought out, and Miss Dorothea Proud has performed a very useful service in her able and well-constructed account of "Welfare Work."* The writer has, as we are told by Mr. Lloyd George in his Introduction, served in the Welfare Service of the Ministry of Munitions since its foundation, as well as devoting years of inquiry and research into the conditions of welfare work as carried on in the factories of the Commonwealth and of Great Britain. The definition of welfare work adopted is the "voluntary efforts on the part of employers to improve within the existing industrial system the conditions of employment in their own factories." Profit-sharing and co-partnership are excluded by this definition, and no opinion is expressed as to the permanency of the existing system or the possible alternatives. The writer points out that, while welfare work is undertaken both in America and England, in the former it is undertaken mainly because it is recognised as being "good business," while in England it is carried out from mixed philanthropic and business motives, a deduction which, if true, is a little singular.

The first part of the book deals with the Employers' Influence on Factory Legislation, and shows that the initial steps were the result of experience gained by employers and not of agitation on the part of the workers. The first Factory Bill of 1802 and the first tentative Ten Hours' Bill were carried through Parliament by employers. The discovery that more efficient work could be obtained by shortening the hours of labour, and that the amount of work produced could not be measured merely by the time spent in production, was the fact which made it possible to carry legislative measures. The appointment of paid inspectors was advocated by employers, and for this reason was looked on with suspicion by many, though it was the means which made factory legislation effective in the United Kingdom. The efficiency of modern factory legislation has been the result of the system, for the inspectors have become a direct channel of communication between the best employers and the Legislature. Thus the modern tendency has become the legislation of experts in the Home Office instead of that of Parliament.

The theory that it pays to give good working conditions, though considered modern, found expression in Dale, whose factory was described as a model in 1792, and who is referred to as giving his "money by shovelfuls to his employees" and finding that "God shovelled it back again"; and in 1848 a master manufacturer who had provided gardens for his work-people stated, "I believe that, in a merely pecuniary point of view, I am repaid by having better and more willing workmen."

The workers, as the writer points out, are suspicious of philanthropy, while welcoming improvements enforced by law or by trade unions, and it is this suspicion which is productive of many difficulties which arise. Miss Proud recognises that the great majority of modern employers wish to better conditions and that those whose actions are solely dictated by self-interest are now in a small minority.

The book deals with questions of environment, the effect of the provision of dining-rooms, rest-rooms, and other amenities, as well as with ventilation and heating. With regard to the former it is now recognised that what is necessary is to prevent what is called "heat stagnation," and the experiments recently made appear to prove that it is more important that

* "Welfare Work." By Dorothea Proud, B.A.(Adel.), First Catherine Helen Spence Scholar. (London: G. Bell & Sons, Ltd. Price 7s. 6d.)

air should be in motion than that it should be intrinsically pure. It is also pointed out that it is not safe to assume that the healthiness of a room can be entirely judged by the cubic air-space allowed for each occupant. The difficulty of obtaining a suitable floor for factories is also emphasised, and many details of use to architects who have factories to design are dealt with by the author. The questions of wages, hours, recreation, food, mental development, and personal dignity are all treated in this admirable work, which contains many facts and the deductions which may reasonably be drawn from them, but in which dogmatic expressions of opinion are entirely absent.

The employment of women is amply considered, and many points which bear on the problem are discussed with reason and fairness. Miss Proud has produced a book which avoids the pitfalls of becoming either a statement of statistical fact or, on the other hand, a work indicating political bias, and it would be impossible to say from it what the author's political views are.

A century ago Europe saw the dawn of the great industrial epoch; the failure of much effort in the last hundred years has been due to the fact that only the material results of manufacturing development were studied. We are paying now in many ways for our past omission to understand that no State can be permanently prosperous if it does not secure for its population fit conditions of life. The doctrine that a nation's welfare is independent of its neighbours and that it is sufficient to defend the interests of one's own country has been the reason why the States of Europe have allowed a nation to forge the weapons which have plunged a world in bloodshed; and similarly a neglect of the fundamental truth that the strength of a nation depends on securing good conditions for every class of its population might result in plunging Europe into a state of revolution and ruin which we cannot picture. The stability and peace of nations depend on the determination of all to secure international justice, and the stability and prosperity of society in like manner depend on our success in securing good conditions for every section of the body politic.

## THE PROVISION OF HOUSING.

WE give elsewhere a report of the important and influential deputation which waited on the President of the Local Government Board to lay before him the urgent necessity for the assistance of housing after the war by means of preparation during the war and the grant of a large subsidy towards its cost. In a measure we agree with Mr. Long in his assertion that there is no analogy between the provision of money for the war, success in which may be said to be absolutely vital to our existence as a nation, and the provision of money for great and necessary works of improvement after the war. On the other hand, if we had been told years ago that we should be engaged in a three-years' war, which would cost nearly five million pounds a day, many would have said that no State could face so enormous a burden; but we know by experience that we have been able to cope with the problem, and pessimistic prophecies of collapse from financial exhaustion are far less frequent now than they were a year ago. Neither is there any comparison between a subsidy of twenty millions to assist housing, much of which will be capital invested and not lost, and an expenditure of thirty-five millions a week for purposes of war, most of which represents a dead loss.

The war has taught us to take a larger view of all problems, and that larger view should result in action which we might have shrunk from were it not for the knowledge we have gained. It has emphasised the truth that the strength of a nation depends in the last and most desperate resort on the health and strength of the units of which it is composed, and, knowing as we do that health and strength are incompatible with bad housing and insanitary conditions, we should operate to remove the evil as a whole and not adopt the costly and inefficient method of combating the disease with occasional palliatives.

The service of the State has demanded the sacrifice of the lives of its citizens for the common good, and it will rest with the State to show that it in turn recognises its obligation to its citizens.

Mr. Long was naturally not in a position to make definite promises, but we are glad to note that he did undertake in the name of his colleagues that the Finance Act should be amended; and there are many reasons why its amendment should be effected during the war, for in dealing with housing the duty of the State and local authorities is not to act as a universal provider, *but to carry out necessary schemes which private individuals will not undertake.* In the future, as in the past, the solution of the housing problem depends mainly on the private speculator, whose activities unwise legislative enactments have very largely brought to a standstill. Though building on a large scale cannot be put in hand during the war, schemes both public and private may be prepared, and the amount of public rate-aided enterprise will largely depend on the removal of artificial and unnecessary restrictions. It may be unfortunate for the reputation of statesmen that they should have to admit that they have failed, but in the interest of national economy—an expression of which we hear much—it is essential for the authorities to retrace their steps.

It is not necessary, as some seem to assume, that private enterprise should mean "jerry-building" or poor design, since it is possible for every authority to control the planning and arrangement of new districts and to a great extent to control the design of new housing schemes. The functions which they should undertake are to lay down schemes securing the needful amenities and to allow private enterprise to carry out the work, and it is by utilising the skill of designers and town-planners that the best results will accrue both to public authorities and private speculators.

One of the speakers assumed that architects' fees and other charges might be saved if public authorities undertook their own work; but such an assumption is as absurd as a proposal to employ labourers to turn out joiners' work in order to effect an economy in the wages paid.

The urgency of the problem is brought home to us by the statement that houses in Scotland which were condemned fifty years ago are now used for human habitation, and in the statistics relating to the immense number of single-tenement dwellings now occupied. It is only by the assumption that human beings differ fundamentally from one another in their physical attributes that we could ever imagine that any families ought to be housed in single rooms, and statesmanship must indeed be bankrupt if we have to admit that such abuses must exist in the richest country the world has ever seen.

When an evil is sufficiently great and insistent, as was the case in Ireland thirty years ago, a way is found out, and tenants who with difficulty paid rent for wretched hovels are now among those who pay instalments of the purchase price of their own holdings with regularity and punctuality.

The work of the Congested Districts Boards and the advances made to enable fishermen to buy good boats are gradually converting poverty-stricken districts of Ireland into prosperous and contented ones, though the measures employed would not have been recommended by economists in the earlier years of the nineteenth century. It is the path of wise statesmanship to eliminate the necessity of bitter political agitation, with all its deplorable results, by taking remedies before evils have become chronic. It is the path of wisdom gradually to pay off debts so as not to be saddled with the repayment of principal and interest alike, and the same policy has an intimate bearing on the question of the provision of housing.

We must, in conclusion, express our hope that the suggestions put forward by the National Housing and Town Planning Council will result in definite and sympathetic action by the Government of the day, whatever its political complexion may be, that our people may be fitted to take their place in the great industrial struggle which undoubtedly lies before them.

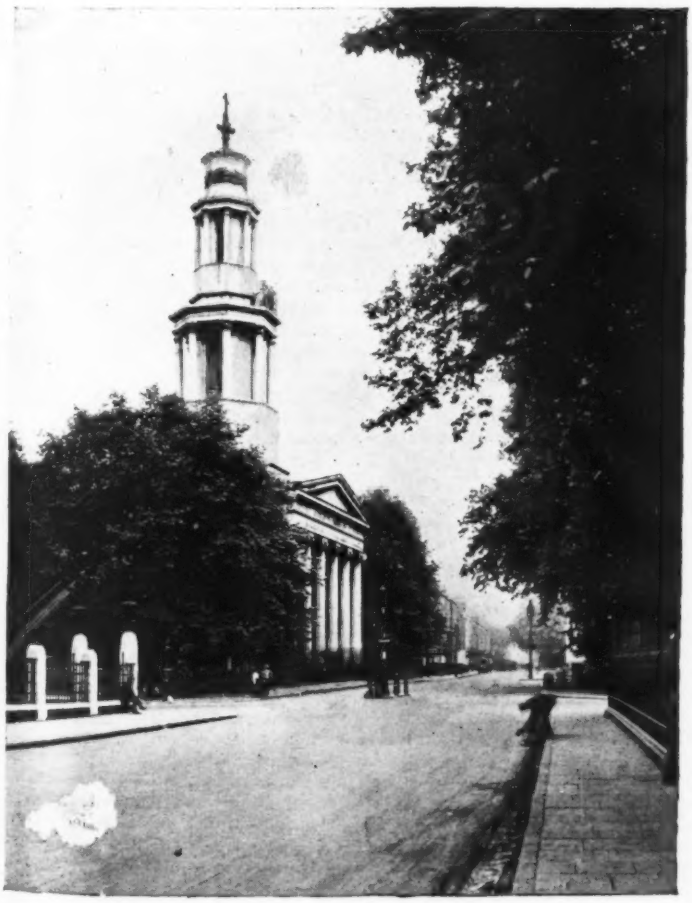
# NOTES.

**The Duke of York's Column.**

It is curious with what persistence suggestions are made for the removal of the Duke of York's Column. Those who make these do not of course realise that the Duke of York's Column is one of the most satisfactory City ornaments we possess, not only in itself, but in relation to its surroundings. The architectural compositions of which the York Column is the centre, its fine flight of steps the foreground, and the two ends of Carlton House-terrace the flanks, as seen from the Mall, are amongst our best scenic effects. The effects of association are, however, so great that the public forget the ridiculous design in the grandeur of the object commemorated when they contemplate the Nelson Column, whilst they associate a distasteful estimate of character with both subject and design in regard to the Duke of York's Column. Those who can dissociate the design from the object, however, will surely disagree with the suggestion in the *Daily Chronicle* that "the Kitchener Memorial might well displace the Duke of York's Column." It certainly occupies "one of the finest sites in London," and very worthily too. The view down Lower Regent-street, of which it forms a fine centre, is one of the best in London, and we can point to no other monument perhaps which, in proportion to its one effect, is so in keeping with its surroundings. In Trafalgar-square the Nelson Column, besides being a ridiculous application of a building column and holding aloft a ridiculous figure, has a depressing and overwhelming effect on all its surroundings. In Waterloo-place the column not only forms a striking object in distant views, but is so placed that it does no harm at close quarters. Is it perhaps in accord with the eternal fitness of things that our fine decorative column was erected by means of a forced subscription in the British Army? We suppose few of the thousands who toil up the Monument as one of the sights of London have any real regard for the outstanding qualities of that noble column, which is one of the finest tributes to the genius of Sir Christopher Wren. There is truly a grim comicality in the way we try to decorate our cities and in the estimates we form of what we have done.

**A New System of Building Construction.**

The Burgh Surveyor of Dunfermline states that a clerk of works has drawn his attention to a new system of building construction which he has patented. "The new system would not comply with the local regulations, but, from what he had seen, it was a departure for the better in the way of cheapening construction. He advised the Court to see the models," which they propose to do. We should much like to see a new system of construction which would be efficient and at the same time cheapen construction, but it is probable that the new methods are in the main those which we should use were it not for the net in which local by-laws have entangled the craft of building. It is a pity that every case cannot be judged on its individual merits by a competent man or men; but as this is not possible it would be a good thing if some of our local building Acts could be simplified so as to fetter reasonable design and construction to a less degree than they do at present.



**St. Pancras Church.** (*See page* 184.)

**War Statistics.**

So much is said about the rise in food prices in connection with wages that it may be well to state the facts, and also to see how favourable are the conditions in this country as compared with some other belligerent countries. It is true that taking the country as a whole the average rise in retail food prices is 59 per cent. above the pre-war level, or 65 per cent. including the additional duties on tea and sugar; but according to the *Labour Gazette* the increased cost of living to the working classes, taking every expenditure into consideration, is about 45 per cent. Since the outbreak of war wages have steadily been advanced, the net result of the changes in rates of wages amounting to an increase of close upon £1,000,000 a week, exclusive of agricultural labourers, seamen, railway servants, police, and Government employees. In Berlin in July the general level of food prices was 117·6 per cent. above pre-war level; but there, even at such increased cost, many articles are unprocurable, and many are of inferior quality; whilst in the same month in Vienna the rise in food prices is estimated at about 161 per cent. It is unfortunate that no statistics are available as to wages in Germany and Austria, but it may safely be assumed that the rates paid have not kept pace with the rise in the cost of food. Employment in this country has been remarkably good, but it is to be regretted that in such strenuous times 1,926,100 working days have been lost in the eight months of this year owing to trade disputes. In Germany in July the building trade operatives who are trade unionists and were unemployed is stated to be 0·5 per cent., but the number of workmen included in the return is very small for so large a country, being but 70,683. Our trade union returns chiefly comprise only carpenters and plumbers, and it may be the same in Germany; but even then our return includes 78,287 members, of whom 0·9 per cent. were unemployed. The "insured" members of the building trade, exclusive of those serving with the forces, is 545,291, and of these only ·86 per cent. were unemployed.

**Occupation of Premises by Government.**

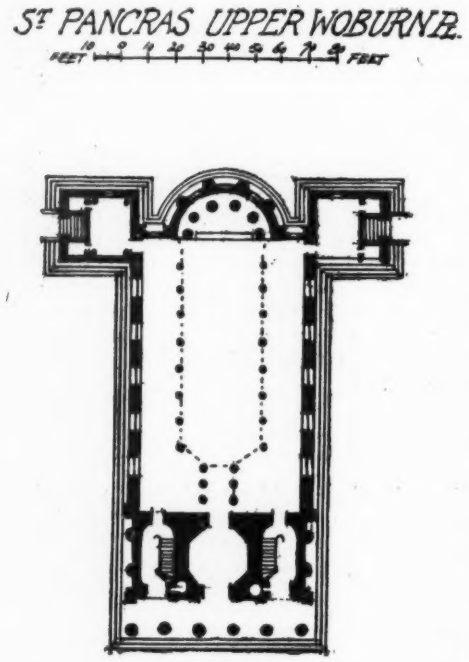
In our issue for August 11 we referred to the rights the Government enjoy of taking possession of premises under the Defence of the Realm Act and to the decisions of the Courts that compensation cannot in such circumstances be claimed as a legal right. At the recent meeting of the debenture and share holders of De Keyser's Hotel, convened by the Receiver and Manager, it was stated that the Government had requisitioned the hotel as quarters for the Royal Flying Corps, and that the Government had refused to pay any rent, and it was resolved to institute proceedings with the view of obtaining a decision of the House of Lords on the question. It would be hardly accurate to say that the Government refused to pay any compensation, as the Receiver was referred to the Defence of the Realm Losses Commission; but he declined to lay his claim before that body, because he stated that the Commission hold the view that it is a derogation from the prerogative rights of the Crown to pay an occupation rent. And in a letter from the Army Council it is stated "that in the case of properties requisitioned under the Defence of the Realm Act, whilst the Departments concerned are precluded from entering into ordinary commercial negotiations, arbitrations, or agreements for occupation rentals, provision is made for recouping owners for any direct and substantial loss arising out of such occupation of their property by an award as an act of grace." The case will be watched with interest, as it raises some curious points. The hotel was in fact being worked at a substantial loss, but this loss was being incurred with the view of keeping it as a going concern ready for "the piping times of peace." In these circumstances it was deemed useless to go before the Commission, as no "direct and substantial loss" could apparently be proved. The Government, indeed, may say they are saving the hotel company some £5,000 a year, as that was about the amount of the loss being incurred. The capital in the hotel represents a sum of some £350,000, however, and the Government have the benefit of the use of the greater part of the building. There certainly seems some ground for suggesting that the prerogative should be strained, and that a body of private individuals should not be called upon to house a section of the forces rent free. Possibly other matters complained of, such as the use of the plant for electric lighting and of the water from an artesian well, would be matters taken into consideration by the Commission.

## THE LONDON CHURCHES OF WREN AND LATER ARCHITECTS OF THE RENAISSANCE.

### No. LIII.—St. Pancras.

THE Church of St. Pancras forms a conspicuous landmark in Euston-road, and is interesting as being the most ambitious effort of the Greek Revival architects as applied to ecclesiastical architecture in London. The church was built to meet the wants of a rapidly growing district under powers given in Acts of Parliament (56 George III. and 1 & 2 George IV.). A competition was held for designs, the first premium being awarded in June, 1819, to Messrs. W. & H. W. Inwood, who were appointed architects. Contracts for the new building, amounting to over £50,000, were accepted, and building was commenced in 1819 and completed in 1822, the total expenditure on site and buildings amounting to £76,679 7s. 8d.

The church must be judged by the standard which the designers set before themselves—that of building a church in close accordance with the precedents set by ancient Greek architecture, judged by which it will be held to show much ingenuity in contrivance and




great knowledge and refinement. The steeple is an adaptation in design of the Tower of the Winds; the church is an imitation in design as far as circumstances allowed of an Ionic temple; the two wings which contain the vestries and entrances to the vaults are based on the caryatid porch of the Erectheon, much marred by the great coarseness of modelling of the figures employed, a coarseness in marked contrast with the care and refinement with which the church is detailed architecturally.

The interior of the church, though dark and gloomy, is very interesting, especially in respect of the detailing of the iron columns supporting the galleries, the pulpit, and the organ.

Most of the ornament, including the capitals of the columns, has been carried out in terra-cotta, in which the colour of Portland stone is so closely imitated that the difference is not easily detected. The chancel and altar-table have been recently completed from designs by Messrs. Adams & Holden, and are in complete harmony with the remainder of the work.

Though we can but wish that the church had been designed on other lines, it is of its type both good and interesting.

### A DECEASED BUILDER'S ESTATE.

Mr. James Catley, of Kenilworth, Cambridge Park, Wanstead, retired builder, has left estate to the gross value of £43,063.

## THE PUMPS OF LONDON.

IT is essential when discussing particular features of this ancient city to assume a train of thought in harmony with the past, figuratively to don a bag wig, a three-cornered hat of the Egham, Staines, and Windsor variety, knee-breeches, laced coat, square-toed shoes, and elegant silver buckles. Then invoking Trivia, to set out on our quest and strut the flagged stage, for the set-pieces are already in position. London echoes the past as no other city does. This August morning I listened to the song of the women hawking bunches of lavender through a London square; they were followed by a man crying old chairs to mend, and finally by an explorer in quest of discarded metals. Three curious survivals of the eighteenth century—a period when the cries of London were distinctive and in some cases marked the season, but regular enough in certain districts for the maids below stairs to check the kitchen clock each day.

The vendors of lavender, white-aproned and gowned in black, with enormous hats trimmed to match the attractive wares in their baskets, chanted in turn the sweet song handed down to them from the past. If I buy a bunch of lavender, I ruminated, I shall need a vase for it, and, if I find a vase, water to fill it; and where can I find water at a moment's notice?

Then I noticed the spout of a pump standing beneath the umbrageous foliage of the gardens in the square; here indeed was subject-matter for discussion—pumps, conduits, fountains, a whole series for review, and the excuse for this gossip was to hand.

It is natural for Londoners to express sociability for inanimate objects, or even to go so far as to touch posts and railings and to step over the joints in paving-stones. They look upon the friendly faces of clocks in the streets and count them fast friends, and the myriad stacks of spears guarding areas call up visions of train bands of Stuart days and volunteer brigades of the Napoleonic era. They are unquestionably in sympathy with current events. The old pumps that have fortunately survived change and demolition have also entered into a second youth, for recent legislation has conscripted them into service at a time when their existence was almost forgotten.

Having decided to study these instruments in their respective spheres, we must make our way to the king of the band in Aldgate. There it stands sentinel in solitary grandeur at the junction of the ways, with its griffin head spouting a cool stream to the accompanying rhythm of its tail. It is a monument of the ancient conduit system, an eighteenth-century member with a purpose, both decorative and useful to the City. How anxiously East End champions for athletic conquest eye this pump when, laden with a tier of baskets, they walk in competition to Covent Garden or Hammersmith for money prizes, and with what relish the enthusiasts who undertake to walk round the world refresh themselves at the founthead for their self-imposed task before starting! For this stone obelisk, with its bracketed pent and tooled vermiculations, is the recognised landmark from whence local amateurs may begin their race for notoriety. Aldgate Pump repays a visit and begets confidence, for it needs temerity to work the handle in full view of half the City. (See inset illustration.)

The queen pump of the City is sacred from ordinary eyes, for the Leathersellers in St. Helen's-place guard the person of her majesty in their private yard. This curious machine is wrought in the shape of a mermaid engaged in pressing her breasts, and it is a legend that on festive occasions wine once flowed to nourish the citizens. Caius Cibber gave life to the queen in 1679, and stationed her in St. Helen's-place as payment to the Company of his livery fine of £25.

Almost unnoticed by the passengers, the iron obelisk pump in Cornhill stands alone and black, yet it is a disciplined veteran neatly uniformed and decorated with the arms of four insurance companies, who erected it in the late eighteenth century. (See inset illustration.)

There was formerly a pump in Ironmonger-lane, to which it was the regular custom of Alderman Boydell to repair at five o'clock precisely in the morning, for he was a very early riser. There, after placing his wig upon the ball at the top, he used to sluice his head with its water. This well-known and respected character founded the Shakespeare Gallery in Pall Mall and was a patron of the younger Dumas. On the north side of St. Paul's Churchyard there is a plain stubby pump for the use of the porters who could not afford their favourite variety of beer, to which the name of porter has been given. Making our way down Ludgate-hill, past the site of the Belle Sauvage, once the haunt of the elder Weller, and famous for its pump, for in those days all the coaching inns were self-supporting in this regard, we reach Fleet-street and enter Serjeants' Inn. Here, next to the elegant railing designed by Robert Adam for the Amicable Society, we chance upon another pump standing shyly between the Portland stone rustications and the sober doorways of early Georgian houses as if fearful of being seen. We nod to it in recognition of its duty, and, in answer, its spout points silently to Hare-court, so we follow the indicated direction and cross into the precincts of the Temple.

Yes, this stern object on the right is the immortal pump of Hare-court, described by Gurth in his "Dispensary":—

> "*And dare the college insolently aim,*
> *To equal our fraternity in fame?*
> *Then let crabs' eyes with pearl for virtue try,*
> *Or Highgate-hill with lofty Pindus vie;*
> *So glow-worms may compare with Titan's beams,*
> *And Hare Court pump with Aganippes streams.*"

Then, inquiring of the porter at the Middle Temple gate, we hear of a pump in Staple Inn, which is still in working order, and make our way to this rendezvous in order to test the quality of the water, and so through Gray's Inn we come to the great district of Conduits.

This long street of shops is Lamb's Conduit-street once the Bond-street of Bloomsbury. There should be some pumps hereabouts. The name is appropriate, for the first conduit was founded by one William Lamb, in the reign of Henry VIII. Lamb collected several streams to form a head of water, which he conveyed to Snow-hill. There is now no trace of the conduit which Wren rebuilt at the expense of Sir Thomas Duns. It was removed in 1746, probably as part of the scheme to quietly do away with public water supplies and to force the citizens to have New River water. There was once a pump on the conduit head against the corner house of a small turning in Lamb's Conduit-street, but not a sign of this remains. Mournfully we turn away and, crossing Bedford-row, reach Jockey's-fields. Here we greet a fantastic pump of the iron order, strapped at the waist in Elizabethan fashion and annuleted at the neck. This pump was evidently an eminent advocate of teetotalism, for it was equipped with two spouts, and no doubt waxed eloquent of the crystal stream. It is silent now, for long ago its tail was shorn, yet one cannot view its bulbous foundation without thinking of some clear well far beneath the kerb.

Queen-square boasts a single-spouted replica of this pump, now doing service as a glorified lamp-post. It stands in a charmed circle of dwarf cast-iron obelisks, and mutely protests at the presence of a street orderly bin which the authorities have placed at one side. Like its *confrère* at Jockey's-fields it lost its tail some years ago and ceased to give a free supply. While here we make a few judicious inquiries and learn of a pump that used to cross St. Clement's Well, near the Strand, but fearing that this is a legendary statement, or that it has been swept away when the last century was young, we forgo our inquiries. By this time we are authorities on pumps, and spell them out with the perspicacity of water divines; surely, we think, the London squares are furnished with machines for lifting water, the gardens demand liquid refreshment, and the Hackney cab-stands must have relied on an unlimited water supply.

In Russell-square our quest is rewarded by the discovery of a strange contraption, rusty and unmanageable, on the northern side, with fearsome wheels and cogs, and a miniature cheval de frieze facing the garden path. No

doubt this machine was specified by the elder Burton when he laid out the square. It must have caught the surly eye of old Sedley. Vainly we searched Soho. There were no pumps, and even Hanover-square seemed void of this form of machine. But after inspecting the Oriental Club we conjured up visions of the East, and on further investigation found that some genius of Early Victorian days had conceived the subtle idea of a serpent rising in the grass and darting its venomous head through the railings to offer water to jaded horses. Westwards we must go, and still further west, until salubrious Bryanston-square greets us. Here we make a discovery worthy of note, a pump of Greek character, nothing less than a Doric column surmounting a water-box. Our peregrinations at last call for a halt; the day is far spent, so back to chambers to glean what we can on the subject from Hine's "Every Day Book," and there to chance upon a description of the pump that formerly stood in Webb's-lane, Hammersmith," with a sort of font in front of it to catch the water."

*"A walking man should not refrain*
*To take a saunter up Webb's-lane*
*Towards Shepherd's Bush, to see a rude*
*Old lumbering pump. It's made of wood,*
*And pours its water in a font*
*So beautiful that, if he don't*
*Admire how such a combination*
*Was formed in such a situation,*
*He has no power of causation,*
*Or taste, or feeling, but must live*
*Painless and pleasureless, and give*
*Himself to doing—what he can,*
*And die—a sorry sort of man!"*

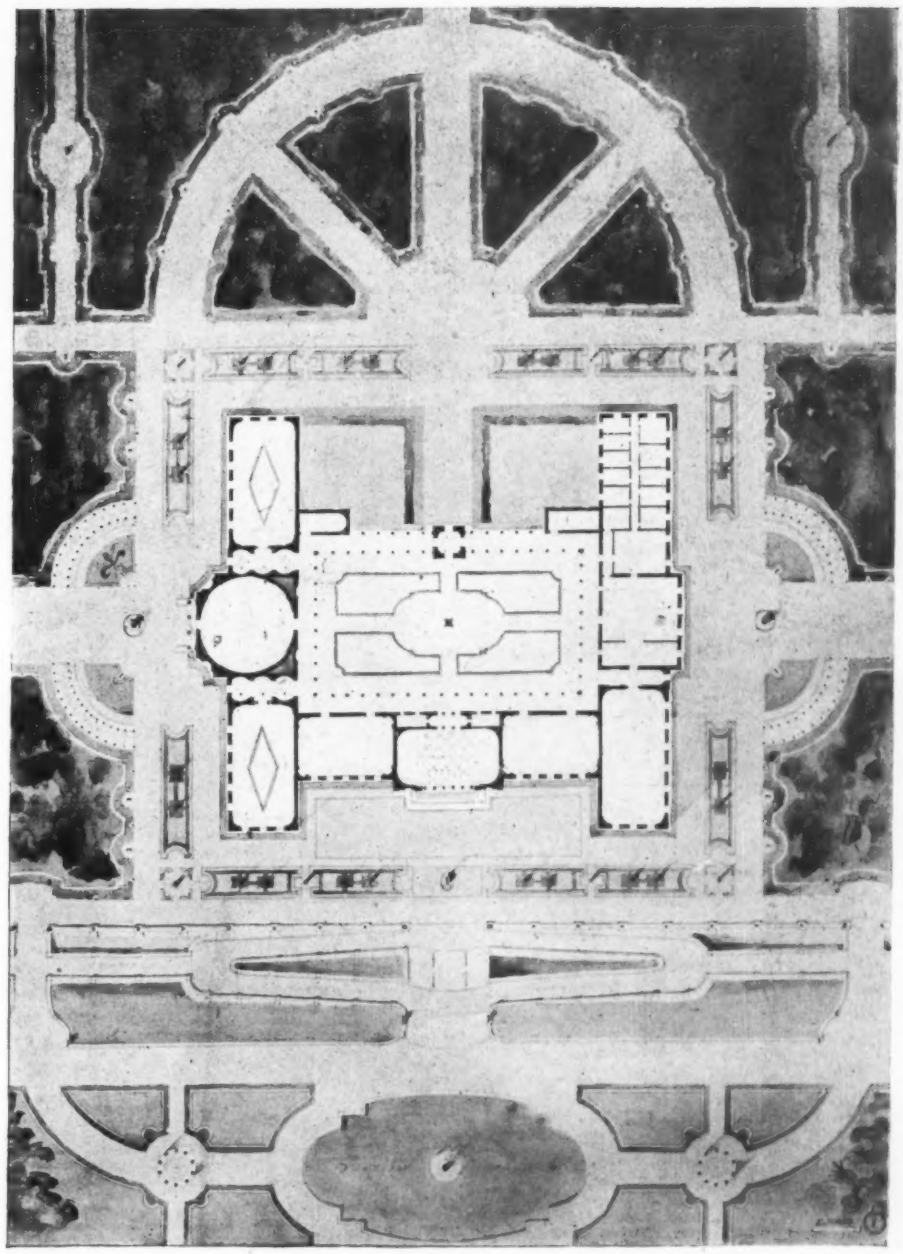
"Yes," I can hear you say, "thank goodness this interminable gossip is about to end, we have had enough of this essay on cold water; but these remarks would be incomplete without some mention of the elaborate carved wood pump which some artistic craftsman produced in the Louis-Seize period. This splendid machine, embellished with rare ornament, is now protected under the roof of the South Kensington Museum. Judging from its style and perfect workmanship, its function must have been to dispense champagne.

## LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE EXHIBITION.

THIS year the annual Exhibition of Students' Work has been held somewhat later than usual, owing to the Final Examinations taking place in July instead of in June. It is a surprisingly large exhibition in the circumstances. Since October, 1915, the School has had to depend for its students upon persons not eligible for military or naval service—*i.e.*, upon those who have been rejected or discharged by a medical board, or who are under or over military age, and upon subjects of neutral or allied nationality. The result has inevitably been a great loss in numbers. Nevertheless, the exhibition gallery of the School is well filled, and by drawings which do not indicate any lowering of the standard previously maintained.

The gallery is partitioned by screens into the following subdivisions:—The first group of cubicles contains preliminary or first-year work; the second group the work of more advanced certificate and degree students; and the third is devoted to drawings submitted for the Diploma. It is in this latter portion that the most competent performances in design, draughtsmanship, and rendering are to be seen. Particularly to be commended are the colour studies of Mr. F. Jenkins, the influence of whose manner is to be detected in the drawings of other students. American and French models appear equally to have contributed to the formation of his style. By comparing dated drawings one sees how, from a sedulous imitation of Paul Crêt, Guérin, and Despradelle, has emerged a personal technique of much charm and distinction.

Amongst the certificate candidates Mr. S. C. Foulkes and Mr. G. Hemm, both of whom have obtained a First Class, attract the most attention. Mr. Foulkes has succeeded in gaining the first Lever Prize for the remodelling of the Central Area of Birkenhead. This area includes Hamilton-square, the Woodside Terminus, the Birkenhead Landing-Stage, a power-house, lairages, a station of the Mersey Underground Railway, and the point of departure of the Birkenhead tramway system. A considerable slope exists from the square down to the stage. At present the whole site is a muddle of tortuous streets, irregular levels, and mean property. Of the larger buildings, to which reference has already been made, the houses round Hamilton-square and the Town Hall alone are worthy of preservation. Yet the area possesses the greatest civic importance, since it constitutes the main approach to the town from Liverpool. An enormous volume of passenger and goods traffic passes through it daily, going to or coming from the ferry. To provide an arrangement of properly-graded streets, to establish direct traffic routes, to connect, re-group, and develop the elements of the whole, and to give to them a worthy architectural treatment was the task assigned. The large plan, in which Mr. Foulkes' scheme is principally set forth, is a very lucid production, admirably rendered. Though essentially a simple scheme, it neglects to satisfy none of the complicated demands of the site, and is an object-lesson in what can be achieved by a meticulous study of conditions in the first place and in the second by a bold vision. The early nineteenth-century tradition which inspired the Hamilton-square façades is, in a modified fashion perpetuated in the designs for the new work. Thus the cohesion of the plan is sustained in the elevational treatment.



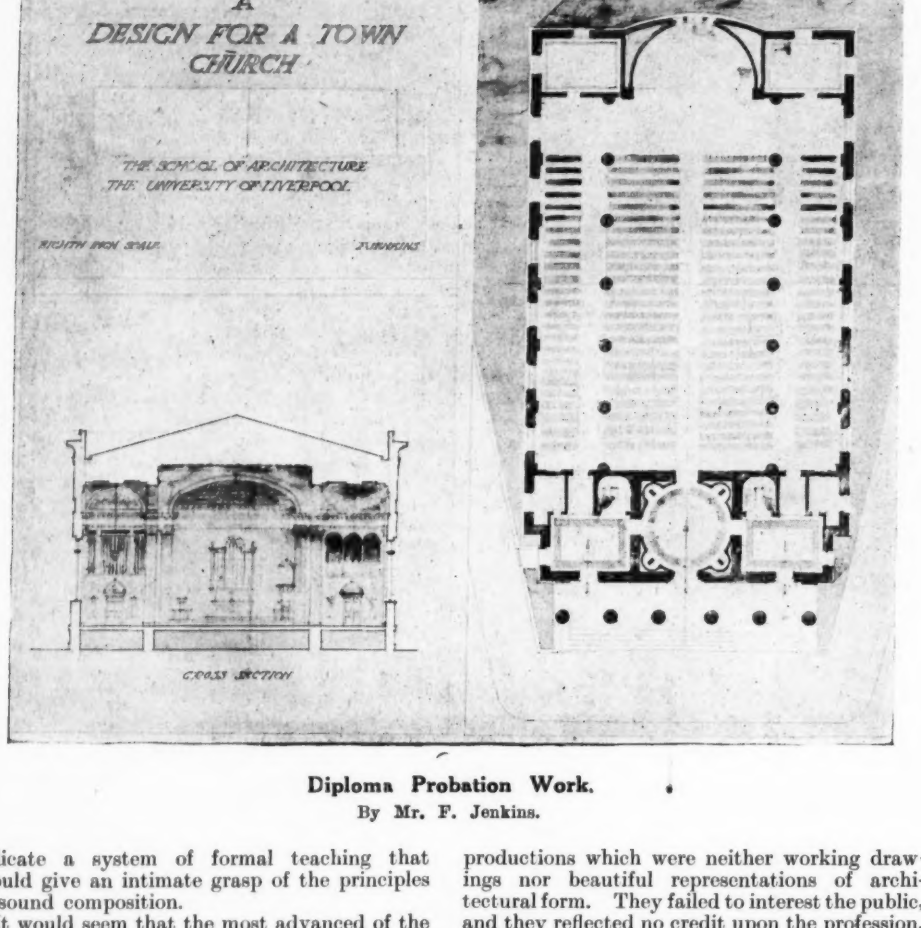
**Diploma Probation Work.**

By Mr. F. Jenkins.

*Projets* for a cinematograph theatre, a school chapel, a pavilion for sculpture, and many other subjects are shown by Mr. Foulkes. In all there is evident a just appreciation of practical requirements and the ability to embody them in scholarly architecture.

To Mr. Gordon Hemm, the winner of the Holt Travelling Scholarship (£50) and the Second Lever Prize, one must concede the possession of superlative endurance. His output exceeds that of any other student by at least one hundred per cent. Not only are his drawings twice as numerous, they are frequently twice as large as those of any other exhibitor. This applies to measured work as well as to designs. Quite the most elaborate of the latter is his project for a Courts of Justice, intended to be submitted in the first part of the competition for the next Rome Prize. The detail for the entrance frontispiece is certainly the largest and probably the most fully-stated drawing ever done in the School. Most of the greater Classic buildings in Manchester have been measured by Mr. Hemm, and are presented in peach-black or sepia rendering.

The work of the first-year students is consistently restrained and sound. Antique or Renaissance prototypes have been utilised for the various programmes. Were that not so certain of the studies might be considered too precociously mature. As it is, the results




**Diploma Probation Work.**
**By Mr. F. Jenkins.**

indicate a system of formal teaching that should give an intimate grasp of the principles of sound composition.

It would seem that the most advanced of the first-year students is Mr. T. Medina. His draughtsmanship is precise and delicate, and his handling of accepted *motifs* remarkably sure. Mr. A. C. Holliday also shows some excellent work, less highly finished, occasionally a little too loose in the articulation of small enrichments, but on the whole considered with care and well presented. It is interesting to observe in the case of two Belgian students—MM. J. Rayée and E. Hofmann—how their national characteristics assert themselves in design. No amount of academic repression, one feels, could affect the exuberance of spirit which conceived the "*Projet pour un hôtel à Westende.*" That spirit may accept the scholastic yoke for at most two or three *esquisses* in succession, then it will have its fling.

A number of good drawings are exhibited by Messrs. Subbing, Gregory, & Rushworth, the two former offering constructional isometrics of some complexity. Mr. Rushworth's Italian Courtyard and Colonnade—a first design—deserves special mention. It demonstrates the value of instruction which restricts primary essays in composition to the use of a few canonised forms.

There remains to be noted one practice which pretty generally obtains throughout the work shown. Instead of the Victorian custom of loosely floating $\frac{1}{8}$-in. scale plans, sections, and elevations on a single sheet, and thereby producing an effect which is at once unconvincing and unpleasant, the American system is adopted. Each $\frac{1}{8}$-in. scale illustration has its own separate frame within the main containing margin. In some cases those complementary diagrams which are least important in the particular circumstances are reduced to $\frac{1}{16}$-in. or even to $\frac{1}{32}$-in. scale, and are indicated very lightly in the corners of the sky or foreground of a large-scale drawing. Construction diagrams are kept absolutely distinct from these architecturally rendered drawings. Generally the latter are devoid of any accessory illustrations, and are to be regarded as the presentation of the purely æsthetic aspect of the subject. They are, therefore, fully rendered with background treatment, etc., and enclosed in a carefully-regulated border. This system has every advantage. The old-fashioned English method of confusing the issues resulted in productions which were neither working drawings nor beautiful representations of architectural form. They failed to interest the public, and they reflected no credit upon the profession. The abandonment of so disadvantageous a tradition is sincerely to be welcomed.

## THE HOUSING QUESTION:
### DEPUTATION TO THE PRESIDENT OF THE LOCAL GOVERNMENT BOARD.

A DEPUTATION from the National Housing and Town Planning Council and many other bodies interested in the subject was received on the 20th inst. by Mr. Walter Long, the President of the Local Government Board, with reference to house and town-planning work after the war, and more especially the need for making preparations to avert a possible crisis of unemployment in the building trade by careful preparation of housing schemes. With Mr. Long were Dr. Leslie Mackenzie (of the Scottish Local Government Board), Sir Noel Kershaw, Sir Horace Monro, Mr. Hayes Fisher (Parliamentary Secretary to the Local Government Board), and Mr. Dickinson (Chairman of the Housing Department of the Local Government Board).

The deputation was as representative in its character as was the April Congress, which was attended by 400 delegates, representing local authorities in England, Scotland, and Wales, professional associations, building trades employers and workmen, trade unions, and many societies interested in questions of social welfare.

Councillor Harold Shawcross, J.P. (Chairman, National Housing and Town Planning Council), said that, as Chairman of the Congress held in London last April, he had been deputed to give the conclusions then arrived at. The provision of working-class houses had of late become a most pressing question owing to the failure of private enterprise to meet the need, and at the close of the war the situation would be worse owing to the difficulty of raising capital and the high cost of materials. It was stated at the Congress that in the ten years 1904–14 the cost of a similar house in the provinces had increased from 5s. 6d. to 7s. 6d. a week, and would at the close of the war be further increased by 2s., without considering the increased cost of building material after the war. This was bound to deter building enterprise of all sorts. They felt that to meet the crying demand for more houses reliance must be placed upon local authorities being induced to do the work. They were convinced that this shortage of houses was a serious menace to health, not only through the overcrowding it entailed, but because local authorities were obliged to permit families to continue to live in insanitary houses as there was nowhere for the people to go to if they were turned out of their homes. They therefore asked the Government to give effect to the principal resolution passed at the Congress:—"That this Congress urgently directs the attention of the Government to the critical need for the provision of additional housing for the working classes, and in respect of the national interest and responsibility in the matter urges upon the Government to set aside not less than £20,000,000 to make such advances to local authorities and other agencies as will enable them to provide houses at reasonable rentals having regard to all necessary and equitable circumstances and conditions." This resolution was passed in preference to one proposed which asked the Government to re-enact the Housing (No. 2) Act and to give the same terms to local authorities as were offered under this Act. Reference to this Act was not approved of by the Congress because there were many representatives of local authorities present who had tried to obtain a grant under it and had been refused, as they could not prove unemployment in their districts. He had therefore been asked to urge the Government through the President not to make unemployment a *sine quâ non* before granting loans in districts where the want of houses was serious. But, though they asked that unemployment in the building trade should not be a condition in granting loans, yet they fully recognised that every weight must be given to this question, and the primary reason influencing very many who attended the Congress was that the Government should be asked to take steps now to be prepared for this unemployment at the close of the war. They asked, so far as the financial part of the Housing (No. 2) Act was concerned, that the terms offered under it should be repeated, and that either by lending money at the rate of interest in that Act with a grant in aid, or wholly by the latter, substantially 25 per cent. of the cost of the houses should be given, as they felt that without liberal terms action would not be taken by local authorities. They asked that the whole of this £20,000,000 should be lent, and that if there were applications for it within a reasonable time after the conclusion of the war they should be granted. He doubted if during the last three years 10 millions had been spent on working-class houses, whereas at least 60 millions should have been spent to provide for the increase of population, even if not a single insanitary house had been closed. He also felt it would be necessary for the Department to stimulate the local authorities to get ready their plans now for building at the close of the war. The local authorities should be notified what the Government were prepared to do as to lending money at a cheap rate, or by grants in aid, so as to decide the kind of houses to be built and the rents to be charged. The Congress was called not only to ask for assistance for building at the close of the war, but also to consider various hindrances complained of by private builders in the building of working-class houses. Resolutions were passed asking for amendments of the Finance Act, which subsequent speakers would explain. He asked the Government to pass a measure to deal with the difficulties in many districts on account of the anomalies in the compounding for rates, the system being out of date and the tenant frequently paying a higher rent than he should do on account of that system. The local authorities should also be asked to submit schemes for slum clearance, so as to have them ready for putting into operation at the close of the war.

Councillor S. Smethurst, J.P. (Past-President of the National Federation of Building Trades Employers), speaking on behalf of master builders throughout the kingdom, said the statements he would put before the President had been fully considered and were capable of the fullest verification. His first point was that the building trade would suffer more in

consequence of the war and after the war than any other large industry in the country, because people only built when they had surplus money or urgently needed to extend their business premises. It was generally true that the building trade boomed after other people had had a good time, and it continued booming after other industries had begun to decline. Neither of those things was likely to be much in evidence immediately after the war; and the present high rate of money and building materials offered another very serious obstacle to anything like a quick recovery in the building trade. He estimated roughly that the cost of building, having regard to the cost of imported material and the increase in wages, would be about 25 per cent. in excess of pre-war cost. The building trade, in proportion to its size, had sent a larger number of men to war services than any other industry. He estimated, and it was a very low estimate, that 600,000 people at least had gone into war services from the building trade. Those people would return at a time when there was less than the usual amount of employment, because capital was dear and scarce, which would entail a very great deal of unemployment. The Local Government Board had sent out a circular to local authorities asking what works were projected, but that would only touch the fringe of the question. In the national interest it was desirable to find work for those men, even though it had to be done by what had hitherto been considered an uneconomic measure—the granting of a subsidy by the State. If the Government granted the 20 millions they asked for, or only half of it, it would go far towards meeting the difficulty. As representing the building trade, he thought the Government ought to initiate some scheme of the kind by which these men could be employed. Housing was a growing need all over the country. The shortage of houses arose largely from the adverse effect of the Land Values Act, 1909–10, in restricting investment, in causing a feeling of insecurity in the minds of investors, and in paralysing the efforts of those who had to borrow money in order to carry on building operations. Then came the war and brought building practically to a standstill. He therefore thought the Government should make the concession asked for by the Chairman.

Mr. A. G. Cameron (Assistant Secretary, Amalgamated Society of Operative Carpenters and Joiners), speaking on behalf of the building trade workmen of the kingdom, emphasised Mr. Smethurst's point in regard to the number of men who had left the building industry since the outbreak of war. The Government figures showed that in August, 1914, there were 840,000 men of all classes and trades in the building industry, employed principally on private building work. From that time until now 300,000 men had gone from the building industry, of whom quite 270,000 had joined his Majesty's Forces, and about 30,000 were in trades outside the building industry, but connected more or less with war-work. That left 540,000 men at present engaged in building work; 75 per cent. of these were now engaged in Government war building work, up and down the country, this leaving only about 140,000 men on actual private building work throughout the British Isles. At the end of the war at least 250,000 of the 300,000 who had left the industry would return and expect to take up their pre-war occupations. In addition there would be all the men who were now engaged on Government war building work, which would make the 600,000 and over mentioned by Mr. Smethurst, who would expect, and rightly expect, to be employed at their own trade and not be receiving State employment benefit or depleting the funds of their trade unions. Those men ought to be found building work, principally the building of houses, to make it possible for the men fighting for their country to have homes to return to after the war was over.

Mr. David Gilmour (Chairman of the Standing Orders Committee Birmingham Trades Union Congress, and a member of the Scottish Housing Commission), speaking from the trade union point of view, said the points they had come to after careful consideration were, firstly, that there was an urgent need for proper housing accommodation for the working classes, and, secondly, that tens of thousands of families were living in single apartment houses without proper sanitary convenience. This was borne out both by experience and by evidence before the Scottish Housing Commission. They had found families of seven and eight persons living in the same apartment. Births and deaths took place in the one apartment without proper sanitary conveniences. That state of affairs should be altered as speedily as possible. Their third point was that closet accommodation and general sanitation were extremely bad in many instances. There seemed to have been a feeling in old days that one closet for four families was sufficient. In Scotland, at any rate in regard to half the population, only one closet was provided for two families. Private enterprise had failed to meet the requirements, and the trade unions were of opinion that the local authorities should undertake the work, aided by the State, because they could get money cheaper than a speculative builder, and could save money in architects' fees, legal charges, and in many other ways. A builder would take orders much more readily from a local authority than from a private individual, because he had not to wait for his money, and would therefore give better terms. Co-operative housing schemes should be encouraged, but it would be necessary to see that they were not carried out for private gain. Town planning was a necessary corollary of good housing, and should be dealt with at once by local authorities, even where it did not seem to be urgent.

County Councillor George Fraser (Chairman, Middle Ward District Committee, Lanarkshire County Council) said he represented the County Authority of Mid-Lanark, which has a population of about 210,000. Each authority, burghal and county, would have its own particular problem in the matter of housing the working classes, but they all had a case in common in that good housing necessarily is a public health question. As an illustration of their conditions in Mid-Lanark, which was typical of all the industrial districts in the West of Scotland, there were erected in their area in the year 1902 over 1,500 houses. Since that year the number had steadily decreased. In 1913 only 364 were provided, and in 1915 the number was 105, of which fifty were provided by the local authority. In June, 1914, they could have provided in their district a two-room and kitchen cottage house at a cost of £235, which could have been let at a rental of £13 13s. They had taken estimates within the last few months for the same house, and the cost would be £340 (an increase of 46 per cent.), necessitating a rental of £26 10s. He just mentioned these facts to show how impossible it was for local authorities to attempt to solve this problem by themselves.

Mr. E. C. P. Monson (President of the Society of Architects) said he spoke on behalf of his profession generally, one which unfortunately had been very badly hit by trouble caused by the war, not the least of which was the action of the Board in preventing housing schemes, which had already been prepared but not sanctioned, from being proceeded with, and lately by stoppage of building work in many cases through the Ministry of Munitions. It was impossible to say how many architects had been affected, but undoubtedly there were many who were now entirely without work, and this was proved by the statistics which were available at the Architects' War Committee and the Architects' Benevolent Society, which had been doing such good work in helping members of the profession who were greatly in need. The Professional Classes War Relief Council had also given material help in many ways. But there were, however, still many architects available with wide experience in development of estates and the abstruse problems of town planning in its best and most up-to-date notions and who had studied the subject in all its bearings, and whose work testified to their ability, who would be only too willing to assist the local authorities in preparing for them schemes for the laying out and betterment of their districts, also for the designing of houses and cottages which should be an advance on what had gone before and provide those really healthy homes which were so much talked about and not always attained, mainly because the promoters were cramped by their local traditions. If these experienced architects could be employed in preparing designs for housing and town planning, either or both, so that the schemes might be all "cut and dried" and ready to be proceeded with directly the war was ended, it would not only help the architect and surveyor, or at least some of them, to keep their heads above water, but would be a means of pushing forward a great and national work, not only in assisting to provide as early as possible the healthy homes in lieu of the detestable slums and insanitary dwellings and areas which unfortunately existed and disgraced parts of most of our finest and proudest cities as well as many of our villages and urban districts, but also be a means of coping with the thorny subject of possible unemployment in at least one section, and a very large one too, of the community.

Mr. John Robertson (Vice-President of the National Union of Scottish Mine Workers, numbering about 120,000 members) said the housing conditions of Scottish miners were generally admitted to be deplorable. Many houses condemned by the Royal Commission in 1842 were still occupied. According to the Medical Officer's Report for 1913, 21·29 per cent. of the houses in the county of Lanark had only one apartment and 48·40 per cent. were two-roomed houses. In a mining village in Ayrshire there were 227 houses, 116 of which were two-roomed and 111 single apartments. There was only one ashpit, and 50 per cent. of the people had no closets, no washhouses, no coal-houses, and the coal was stored under the bed. At Hamilton there was a population of 38,000 living in houses crowded together on about 300 acres. Of the population of that town 27,000 lived in houses of only one or two rooms.

Mr. A. W. Shelton, F.A.I., said he had taken great pains to ascertain the facts as regards house building during the past ten years in all the important towns and cities in the United Kingdom. Assuming that 83,000 additional houses per annum should be built, and that in addition 31,000 houses should be built to replace those worn out and condemned, in the last five years 280,000 fewer houses were built than in the preceding five, which would seem to justify the estimate, assuming a rural shortage of from 100,000 to 120,000, of at least 400,000 cottages. In any case the shortage was increasing at the rate of probably 200 per day, or 75,000 per annum. The Local Government Board in a recently-issued Report had definitely stated (1) that private enterprise had always been and was expected to continue to be the main source of the provision of houses for the working classes, and (2) that building by local authorities was not required except where private enterprise had failed to provide the houses or houses for a certain class of workmen. The Report also indicated that of 5,692,096 dwelling-houses of the annual value of £20, less than 20,000 had been erected by local authorities under the Act of 1890, and the total number of houses erected up to quite recently by public utility societies was 7,747. The position was, therefore, that private enterprise had erected 97·3 per cent., and the municipalities and public utility societies, etc., 2·7 per cent. These figures indicated the impossible task of providing healthy houses for the people if the main cause which had led to the practical stoppage of house production by the private builder was not removed. The original and principal cause of the greater part of the housing shortage was directly attributable to the Finance Act of 1910, and he felt there could be no improvement until the repeal or amendment of Part I. of that Act.

Councillor John Stewart (Glasgow City Council) said the position in Glasgow amounted to a house famine. The number of unoccupied dwelling-houses of £20 and under had decreased from 20,356 in the year 1913–14 to 3,763 at Whitsuntide, 1916. The Glasgow Health Authority estimated that there were 10,000 insanitary dwellings in Glasgow. If the Corporation enforced their powers of closing and demolishing those houses it would only accentuate the difficulty.

Mr. Ewart G. Culpin (Secretary, Garden Cities and Town Planning Association) said he spoke on behalf of sixty-nine housing

societies of public utility which were engaged in building working-class houses. They had built no fewer than 7,747 houses for workers on land which was held on long leases. To enable them to provide houses at reasonable rentals they felt that certain changes should be made. Perhaps the most important concession required was an increase of the proportion of the total value advanced upon loan and the extension of the period for repayment. With these points conceded they felt there would be no difficulty whatever in undertaking building operations in almost any part of the country.

Mr. C. T. Ruthen (Vice-Chairman, South Wales Garden Cities and Town Planning Association) said all that had been said as affecting other parts of the country, and particularly Scotland, applied equally to South Wales. But South Wales suffered certain peculiar disadvantages due to geographical conditions, and the housing problem was as serious there, if not more serious than in any other district. In the mining districts in South Wales there were thousands of houses where the beds were never cold, being used continually throughout the twenty-four hours by different sets of people. It was estimated that the shortage of houses in South Wales was 40,000, and he thought that town planning should be used there to its fullest extent.

Councillor T. R. Marr (Chairman of the Housing Committee of the Manchester City Council) said they asked that local authorities should be made to clear their slum areas, providing where necessary other sanitary and wholesome accommodation, and that the loss, if any, should be made good from national funds.

Councillor F. M. Elgood, J.P. (Ruislip-Northwood Urban District Council), said ample air space, avoidance of overcrowding, convenience of access, and facilities for recreation were all essentials to the well-being of the community to be housed, and must be considered in connection with schemes of building, great or small. Were town-planning schemes generally in existence these matters would fall into line as a matter of course, and the building of houses would be handled more expeditiously, favourably, and economically. It would not be difficult to convince local authorities to proceed with the necessary steps under the Town Planning Act. In regard to these latter, namely, those authorities who had already initiated schemes, some had unfortunately not proceeded beyond the early stages. In such cases not only was the potential benefit of an advanced or completed scheme lost, but it was said by builders and others that the delay was positively prejudicial to building undertakings by reason of the uncertainty which overshadowed the land affected and the difficulty of obtaining information as to the eventual provisions of the scheme.

Mr. Henry R. Aldridge (Secretary, National Housing and Town Planning Council) said that behind this deputation there was a very deep national feeling, and especially amongst the workers of the country. Nothing, therefore, would be received with greater pleasure than the knowledge that homes would be made ready for the men when they came back from the war.

Mr. Long, in reply, said he found himself in general agreement with much that had been said, and it was certainly a very sorry story to be told in this year 1916. He quite agreed that the task before them lay at the root of all social reforms, and any assistance that it was proposed to give would be no good unless conceived on liberal lines. The Government knew, without being reminded, of what the trade unionists had done and the invaluable assistance they had given to the nation during the war; and they did not in the least cavil at the declaration made, not for the first time, that progress should be made in the matter of housing in order to provide for the men when they came back from the war, when they would have a double claim upon the sympathies of their fellow-countrymen. When the war was over, whatever might be the condition of things as regards finance and other matters, there would be great competition among advocates of all kinds of social reform, and at the root of those reforms lay the provision of houses. He therefore welcomed the deputation, and bid them God-speed in their work. It would indeed be a crime—a black crime—knowing, as they did know, of the sufferings of our heroes in the trenches—he did not mean the sufferings which were the inevitable accompaniment of war in the shape of wounds and death, but he meant that physical suffering from the horrible discomforts attendant upon trench warfare—it would be a black crime if they sat still and did nothing by way of preparation to provide these men with proper homes—to let them come from a water-logged, horrible trench to something that was a little better than a pigsty. That indeed would be criminal, and would be a negation of all that had been said during the war—that we could never repay them. As to the sum of £20,000,000, he could make no announcement then as to any particular sum, and he was not even sure that it indicated what might really be required. He would, however, lay the whole case before his colleagues in the Government, and he could say for himself and the Secretary for Scotland that they would lose neither time nor opportunity in pressing forward the matter, not only in respect to housing, but of other scehmes of employment which had been delayed through the war. They would not spare themselves in trying to bring about a real move for the provision of decent habitation for our people.

## THE BUILDING TRADE AND AFTER-WAR PROBLEMS.

FROM indications one gets from various sources it would seem that much study is being given to questions relating to trade, industry, and commerce, and to the conditions under which they will have to be carried on after the war.

Although the building industry is wholly or mainly a home trade, it cannot view with indifference the relations between capital and labour in the great exporting industries.

If, for example, the high level of wages now prevailing in certain industries continues for any considerable period after the war there will be a tendency for wages in the building trade to advance to a similar level, or, failing that, for labour to transfer to those better paying industries, which would ultimately have the same effect.

A dominant factor in the consideration of those questions must be the methods of trade penetration which were practised on so world-wide a scale by the Germans prior to the war, and which it is fully recognised must be counteracted in the future.

According to a French writer, M. H. Hauser (from whom we take the following information), it will be necessary for that purpose to understand the trading methods of the German banks, cartels, transport organisations, and the economic *rôle* played by the German State, and the relations which subsist among them.

The Germans organised their industrial system with a view to exportation as a means of internal development. Eventually, however, exportation became an end in itself, and from being merely an effect of surplus internal activities it became the main cause of those activities. Originally they exported to avoid a plethora, later they set themselves to create a plethora in order to export the more. They produced with the express intention of inundating the world with German goods.

In 1874 Germany exported to the value of 2,350 millions of marks; in 1900 this figure had nearly doubled; in 1913 it exceeded ten milliards.

The policy brought about an enormous development of manufacturing and productive capacities of one kind or another. Defeat in this war will not annihilate those powers of production, though it may for a time cripple them somewhat. Sooner or later they will have to be reckoned with again.

The expansion of German industry was powerfully aided by the system of banking and credit which prevailed. German banks are at one and the same time deposit banks, credit banks, and financial societies. English and French banking practice consider that prudence demands that those three functions should be kept carefully separate; the Germans united them and formed powerful groups of banks, having a community of interests, at the head of which stands the "Reichsbank."

The advantages of this concentration, which results in almost a unity of direction, is that the great banks can formulate common programmes, they can rise above the mere policy of dividends, take into consideration general and national interests, adopt an industrial policy, direct the placing of capital, Colonial developments, exportation policy, and the development of canals, navigation, and cable facilities. They can exercise a control of the Press and of opinion, foresee crises, and attenuate their effects, prevent panics.

The riches of Germany are, therefore, constantly in a state of financial mobilisation, constantly put at the disposition of credit. At first industry and commerce seem to have captured the banks, but later on the latter captured the former. By the credits they have given they have introduced themselves into a vast number of businesses where they hold a commanding position. They give large credit upon the personal guarantees of their clients, they charge more highly, and they participate in the profits of the concerns they assist, but in periods of crisis they continue to sustain them. They aid them by their own intelligence services. They will even enter into relations with foreign trading concerns merely to ascertain their products and their *clientèle*, and will afterwards place the information at the service of their clients. They maintain and exact an accurate service of intelligence in regard to the clients they assist.

They form branches in all parts of the world expressly for the purpose of helping the growth of the German export trade. Sometimes this is done by acquiring an interest in foreign banking concerns, where they lay themselves out to obtain the preponderance and to dictate the policy. As Siemens says, "Every bank created abroad is the pioneer of the national industry and the point of departure of uninterrupted relations between the two countries."

A German merchant need not wait ninety days for the payment of exported goods if the client abroad obtains from a local German bank a note attesting the reality of the transaction and sends it to the German merchant; the latter can always find a bank in his own country which will discount it, no matter how lengthy the credit involved.

The cartel system as carried out in modern Germany shows an extraordinary aptitude for co-operative effort and a high degree of discipline on the part of those who belong to it.

The conditions most favourable to their organisation are uniformity of product, a certain equality in the cost of production, and the conditions of manufacture, the absence of competing goods capable of serving as substitutes for those subject to the cartel system. The adhesion of the great majority of producers is also necessary.

The system cannot succeed unless each member of it is assured that he is not the dupe of his good faith and that the conditions imposed upon each are scrupulously observed by all. Consequently a system of surveillance is necessary which would be thought inquisitorial in this country. An army of inspectors, representative of both the cartel and of the State, come and go as they like, their business being to verify the accuracy of the accounting, examine the correspondence and the amounts of stock, so that the manufacturer is no longer master in his own works, and trade secrecy cannot be maintained.

Fines are inflicted for each ton delivered in excess of the prescribed quantity, sometimes for each ton under-delivered; also for each ton delivered beyond a certain zone, and for unforeseen contraventions of one kind or another.

As an American observer remarked, "Individual enterprise has ceased, in a large measure, to be the unit in German industry; the German unit is the cartel."

Cartels were first devised to control the price cutting which resulted from internal over-production, but they were led insensibly to establish for the same products two scales

of price, a relatively high one for the internal market and lower prices, variable according to the case, for foreign markets. In short, they adopted a policy of dumping.

Cartels were the subject of much controversy in Germany at one time, so much so that the Government held an inquiry in regard to their constitution and methods. In spite of all, however, the inquiry resulted in favour of the cartels, and it was admitted that their policy had been relatively moderate.

Coincidently with this the cartels themselves corrected their principal defect, viz., a want of solidarity between the various industries and the selfishness of the industries producing primary materials towards those engaged in secondary manufacture thereof. Eventually an *entente* was arranged which accorded preferential prices in respect of primary materials manufactured for export. These favours were accorded not to the individual manufacturer, but to his syndicate or cartel.

Thus was forged the instrument for economic conquest. Thanks to this combination of the cartel system with the policy of generalised dumping German industry obtained a competitive superiority, of which the results have only been adequately recognised in this country since the war broke out.

Thus armed, the cartels set out to kill the competition of other nations upon the markets of the world. The export price varied in every market. For instance, certain goods costing from 85 to 95 marks the ton to produce and worth 130 marks in Germany were sold in Switzerland at 120 to 125 marks, at 103 to 110 in England, but only at 75 in Italy.

They were not satisfied with beating competitors upon a given foreign market, they set out to kill the national industry itself in that market, if there was one. Neither distance nor import tariffs could prevail against this system, because the cartel could always differentiate its price up to the level of the tariff, since it was willing to suffer a loss there until its policy took effect, making the loss up elsewhere by the differential pricing.

The same principles were applied with great ingenuity to the dumping of agricultural products, especially on the Russian market.

Thus German dumping is a coherent system. It kills first in the country where it installs itself the primary industries. Thanks to the differential pricing system, it next attacks the secondary industries also. It thus tries to break down all local competition with the object of reigning upon their ruins itself.

The cartel system has become international in its scope—*e.g.*, steamship combines. It is German military methods as we know them applied to trade and commerce. This is the system which will have to be fought and beaten by our industries after the war.

In the matter of transport the German Government, by its State railway system and its development of river and canal transport, has powerfully aided the expansion of the national industries and its foreign trade and commerce.

The same principles of killing foreign competition by differential rating prevails. These work in both ways, viz., they accord a preference to goods for export and they impose rates against foreign goods coming in unless they are passed through German firms. For example, it costs more to send goods from France to Russia by direct transit than it does to send them first to Germany for ulterior re-exportation to Russia.

The German transport system, combined with certain geographical features, have combined to aid in the concentration of the export trade in a few ports, which has made it comparatively easy for those places to be developed in an extraordinary degree, and provided with the very best facilities for handling a great trade with economy and despatch.

It has also enabled the State indirectly to subventionise its mercantile marine by means of special through rates and by so controlling the emigration traffic from Russia and elsewhere as to divert it from the English steamship lines in favour of those of Germany.

Indeed the *rôle* of the State is a capital one in Germany as compared with this country. In our case the State has grown out of the pre-existing social life of our people, and has merely been allowed to absorb a few functions which civil society found itself unable to fulfil adequately. It possesses only those attributes which our civil society has not retained for itself.

In Germany the State was created by an extension of Prussia to the overlordship of Germany; it has absorbed all power and penetrates into every part of German life; it has closely allied itself with industry and commerce; it is itself one of the largest business concerns in the country.

It runs railways, canals, mines, and what not; it dominates and regulates the cartels; it even aims at making it obligatory for every trader to belong to his proper cartel.

The Imperial policy is at the service of the policy of trade expansion; if the Government permits the banks to make a loan it is only against orders for goods, or it demands tariff favours for its commerce as a condition of granting the loan. It conducts a continual policy of tariff differentiation, often adroitly concealed, in favour of its commerce and against that of foreign nations.

With these four potent weapons the German trade expansion and penetration have been carried on prior to the war. The examination of the way in which they have been applied is interesting and instructive, but too long to enter into here.* It is difficult to see how the result of the war can nullify their efficacy entirely. It is equally difficult to imagine the people of this country submitting to a *régime* of State interference, banking inquisitorial methods, and cartel tyranny such as prevails in Germany.

It looks as if, barring some precautions in the negotiation of commercial treaties and some revision of patent laws, with some further restrictions upon the use of foreign capital in British concerns, that we shall have to rely mainly upon superior productivity and improved selling methods, combined with more careful study of the science of developing foreign markets, wherein much can be learned from German practice, to enable us to beat the Hun commercially and industrially as we intend to beat him militarily.

The present circumstances show clearly that this nation has enormous reserves of productiveness. It is evident that industrially we were not really exerting ourselves prior to the war.

These reserve powers have been called into action by a national emergency which has incidentally raised the earnings of the workers to a height hitherto unknown in this country; it has shown the enormous productive capacities of machinery when worked to the utmost. It has opened the eyes of employers to these hitherto latent capacities. It has also made necessary the imposing of a scale of taxation unheard of hitherto; and it is evident that this high level will have to be maintained for a long period.

Upon the top of these things is the need for combating German trade expansion upon the markets of the world.

There is evidence that these questions are receiving consideration in many quarters. There is a feeling abroad that a new compact is needed between capital and labour by which high wages and high output may be maintained. If such a compact is possible the gravest difficulty would be overcome—taxation could be readily met and our power of competing against Germany vastly improved.

When they began the war the Germans had all the advantages which foresight and preparation could give them in both methods and machinery of war.

We have met them, seen then, and, the present battles are showing conclusively, have gone one better, and we know we shall beat them. Probably the same principles applied to trade competition will achieve similar results and be in harmony also with our national character.

How will a home industry like the building trade fare in the midst of changes of the kind which have been indicated?

If high wages are to be maintained in the other industries they will have to become a feature of ours, but constructional work does not lend itself to intensive production like manufacturing does, and unless some method of co-relating production and wages is arrived at building will become very costly.

Is it not time that employers and workmen in our industry should be considering these questions together and looking for a means of maintaining the prosperity of the building trade under the new conditions likely to obtain after the war?

* For which see "Les méthods Allemandes d'expansion économique," by H. Hauser.

## CORRESPONDENCE.

### Charing Cross Bridge.

SIR,—Various schemes for the new bridge at Charing Cross have been published, and as it is manifest that it is of advantage that any alternative suggestions should be put forward as early as possible, in order that the good points in any scheme can be utilised in producing better, I enclose a plan which appears to me to show certain advantages over schemes at present before the public, in which the bridge is placed in line with Northumberland-avenue.

A bridge in line with Northumberland-avenue would require an approach commencing at Trafalgar-square, in order to provide a sufficiently easy gradient. The access to the Embankment from Trafalgar-square would be lost. Bridge traffic would be concentrated at the south-east corner of Trafalgar-square, which is already a danger spot; moreover the entire rebuilding of Northumberland-avenue would become necessary.

The principal feeding arteries of the bridge will be Piccadilly, Regent-street, and Charing Cross-road.

The Piccadilly and Regent-street traffic would pass by way of Waterloo-place or the Haymarket and the south side of Trafalgar-square, both awkward routes with steep gradients.

From Charing Cross-road traffic would pass the bottle-neck between the National Gallery and St. Martin's Church, descending into the square and up again to the bridge.

The alternative scheme here shown would, I claim, have the following advantages:—

The bridge approach commencing in the Strand at the top of Villiers-street, which is nearly rail level of the existing bridge, the approach road would be practically without gradient as at Waterloo Bridge.

The bridge would be built alongside the existing railway bridge, and so could be built and completed before the railway-station and bridge are dismantled, making it possible to have the new bridge in use practically at the time of opening the new station opposite Waterloo.

Northumberland-avenue would be retained as an approach to the Embankment.

Traffic from Pall Mall would follow the north side of Trafalgar-square, to the relief of the south side, the route to Westminster.

The further street improvements that I contemplate include the removal of the block of stables and St. Martin's Vicarage, on the east side of St. Martin's-place, which would then become a handsome square, with the Church of St. Martin's-in-the-Fields as its southern boundary.

The removal of a portion of the triangular block of buildings in the Strand, and a portion of the churchyard, would then give a broad and direct approach to the bridge from Charing Cross-road with an easy gradient.

Further, Green-street, Leicester-square, should be widened, and the buildings on the west side of the square set back to provide thoroughfare connection with the bridge from Regent-street and Piccadilly by way of Coventry-street.

If the south side of Leicester-square were brought forward, as shown upon the plan, a triangular place would be formed, and the garden enclosure would become a dignified site for a War Memorial.

By doing this, moreover, the ground gained for buildings would equal that given up for street widenings, and the cost of the alteration would be very greatly reduced.

From a practical, economical, and architectural standpoint I consider that the scheme is worthy of consideration.

LIONEL BARRETT, A.R.I.B.A.

# GENERAL NEWS.

### Professional Announcement.

Messrs. Sheppard & Lockton, architects, Newark, have removed their offices to Kirkgate, Newark, opposite the General Post Office.

### Willingdon Hill "Covered Way."

Mr. H. S. Toms, of Brighton, has recently discovered at Willingdon Hill, near Eastbourne, one of the old Sussex "covered ways" that run across the South Downs, joining the head of one valley to that of the other side of the hill. These covered ways, which it is believed are of the prehistorical times, consist of a ditch embanked along both sides, and served for the passage of wayfarers, without being seen, across the ridges of the downlands.

### Students in Captivity.

The first meeting of the newly-formed Committee for the management of the British Prisoners of War Book Scheme, a war charity hitherto carried on by Mr. A. T. Davies at the offices of the Board of Education, but now being registered under the War Charities Act, 1916, was held recently at Whitehall. A letter was read from the Marquis of Crewe, President of the Board of Education, expressing his appreciation of the work done in the past and of the invaluable services which the organisation could render to British prisoners of war by giving them the opportunity of developing serious interests in different directions during the hard and dreary months of their detention. His lordship added that he trusted the work would become more and more fruitful. The following officers were elected:—Chairman, Mr. A. T. Davies (Board of Education); Treasurer, Rear-Admiral J. F. Parry, C.B., Hydrographer to the Navy. The appointment of a Secretary was held over.

### Kitchener Scholarships.

The Council of the Lord Kitchener National Memorial Fund has resolved to found a number of scholarships which will enable young Britons destined for a commercial career to travel, study, and gain business experience in the countries of the Allied nations, viz., France, Russia, Italy, Japan, Belgium, Roumania, Portugal, and Serbia. The original purposes of the Fund will remain unchanged. They are these:—(1) To equip and endow for all time a home for disabled officers; (2) to establish a permanent fund for the purpose of relieving disabled officers and men in their own homes. But the scholarship scheme will supplement these personal benefits by a national service of the first order. The scholarships will be continued from year to year for all time and will be of the annual value of about £150 each. The scholarships will be for the sons of deceased and disabled officers and men of the Navy and Army and young men from eighteen to twenty-five years of age who have served with the forces. The intention is that those elected to hold scholarships should begin their studies almost immediately; that they should receive instruction (*a*) in Russian, French, Italian, and other languages, (*b*) in economics, (*c*) in business principles and business methods (in offices or factories, as circumstances may determine); and that immediately at the close of the war they should be sent for a year to travel in one or other of the Allied countries, and to continue their studies in that country with the view of gaining (1) a close familiarity with its language and (2) an intimate knowledge of its commercial methods, needs, and opportunities. In developing this scheme the Council is being advised by business men and educational experts, so that in the end it may be carried through with the highest degree of efficiency. The Council appeals to all firms and individuals who desire to help in promoting and developing business relations with the Allied countries after the war to give this scholarship fund their cordial and practical support. It is of the utmost importance that the end in view should be speedily attained. Contributions should be sent to the Lord Kitchener National Memorial Fund, Mansion House, London. Envelopes to be marked "Kitchener Scholarships."

### Workmen's Houses.

At a special meeting of the Glasgow Town Council the Corporation had under consideration the resolution adopted at the National Congress held in London recently, under the auspices of the National Housing and Town Planning Council, by which the Congress directed the attention of the Government to the need for additional housing for the working classes and urged on the Government to put aside not less than £20,000,000 to make advances to local authorities and other agencies as would enable them to provide houses at reasonable rentals. On a division the Town Council by forty-four votes to nineteen approved of the resolution, and Councillor John Stewart was appointed to represent the city on a deputation which is to be appointed to meet the Government on the question.

### Reinforced Concrete in an Important Fire.

Whilst the war emergency work of the British Fire Prevention Committee precluded the issue of an early Report on the important fire at the Edison Phonograph Works in New Jersey, U.S.A., during the winter before last, a technical description of this fire has now been published by the Committee as "Red Book" No. 204. The importance of the Report on this fire to engineers, architects, and building owners lies in the fact that the buildings were of reinforced concrete, and this is the first time that a fire of great severity and wide area in a building constructed of reinforced concrete has been under careful technical observation. The fire was not only a very serious one, but very intense; and whilst all other forms of construction and contents became a heap of ruins, the concrete buildings remained, with the exception of a comparatively small section, and could be reinstated in a remarkably short time. The Report issued by the British Fire Prevention Committee, which is from the pen of Mr. F. J. T. Stewart, Chairman of the Committee's allied organisation in the United States, describes the course of the fire, gives a detailed description of the damage done, the effect of the fire on the material, the temperatures developed, the conclusions arrived at, and some notes on the reconstruction. Seeing that the structures under review were erected as far back as 1905, when the modern practice of reinforced concrete was not yet existent, the showing is certainly remarkable. Amongst the lessons learned, however, is that of the necessity that even in this class of construction the buildings should be divided up in fire-tight compartments, and the exposure risk provided against by suitable sashes and fire-resisting glazing. Had such safeguards been provided for the limitations of the extent of this fire the outbreak should have been readily confined to within reasonable limits. The "Red Book" of the British Fire Prevention Committee is profusely illustrated with some twenty photographs, and also with two plans and certain diagrams.

### Exhibition of War Pictures.

Mr. C. R. W. Nevinson has completed a collection of pictures dealing with war, and these are being exhibited at the Leicester Galleries, Leicester-square, W. Mr. Nevinson was one of the first English artists to find himself with the armies in France, and his experiences both as a motor-driver and stretcher-bearer enabled him to see the war in all its aspects.

### Sawmill Combine.

It is announced that sawmill proprietors representing London, Birmingham, Glasgow, Dublin, Liverpool, Leicester, Hull, Sheffield, Leeds, Manchester, Bristol, Great Bridge, Dundee, and Bloxwich have decided to form a National Federation of Sawmill Proprietors of Great Britain and Ireland. The principal object is to protect the industry against foreign competition.

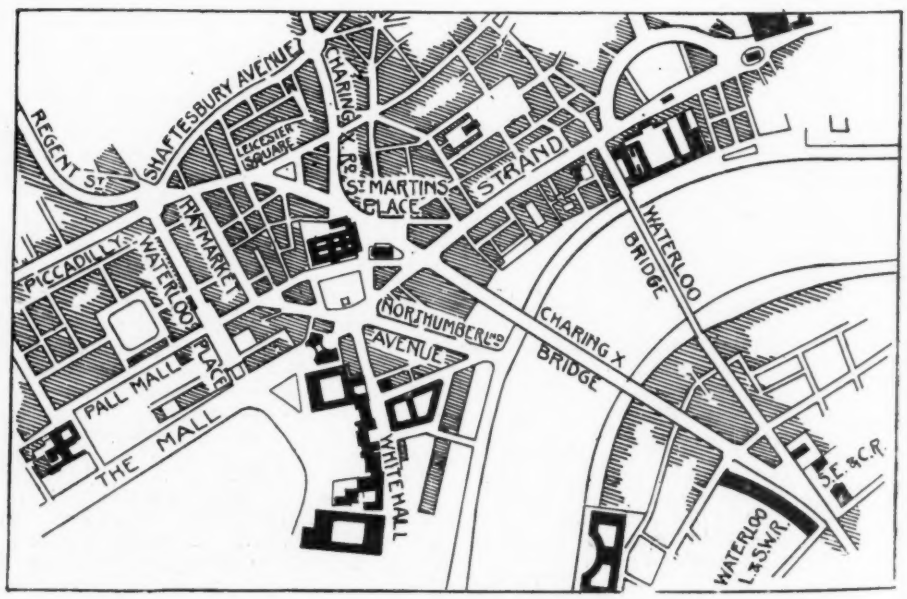
### Australian Parliament Building Competition.

The Government of the Commonwealth of Australia have decided against the further postponement of the competition for the Federal Parliament Building at Canberra. The Secretary of the Royal Institute of British Architects has received the following letter from the office of the High Commissioner in London, dated September 18:—"Sir,—With reference to the deputation which waited upon the High Commissioner from your Institute re the competition for the Federal Parliament House at Canberra, I am directed by the High Commissioner to state that having communicated by cable with the Commonwealth Government he has now received a cablegram in reply as follows:—"With reference to your telegram of September 5, the Government, after careful consideration of the whole matter, including the objections of Victoria and British architects to approved resumption of the competition, considers it advisable to proceed, owing to the fact that after the war the rebuilding of Europe will occupy the attention of British and Continental architects to such an extent that they will not be prepared to compete. Further postponement will only accentuate the difficulty, and meanwhile the large expenditure which has been incurred renders early occupation of the capital very desirable. The work will also provide employment for hundreds of Australians after the war.—I am, sir, your obedient servant,

"(Sgd.) R. MUIRHEAD COLLINS."

### CURRENT LAW CASES.

With reference to the Notes on Current Cases in the Legal Section contained in our last issue, the statement at foot of column 3 p. 174, that third party proceedings could be taken, should read could *not* be taken. In the middle of the same column the words "by a hostile aircraft" should be inserted after "damage was caused to Nos. 15 and 16."




**Charing Cross Bridge.** (*See page* 189.)

## Leading Contents.


| | PAGE |
|---|---|
| THE CONDITIONS OF LABOUR | 181 |
| THE PROVISION OF HOUSING | 182 |
| THE LONDON CHURCHES OF WREN AND LATER ARCHITECTS OF THE RENAISSANCE | 184 |
| THE PUMPS OF LONDON | 184 |
| LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE EXHIBITION | 185 |
| THE HOUSING QUESTION: DEPUTATION TO THE PRESIDENT OF THE LOCAL GOVERNMENT BOARD | 186 |
| THE BUILDING TRADE AND AFTER-WAR PROBLEMS | 188 |
| CORRESPONDENCE | 189 |
| GENERAL NEWS | 190 |
| THE MANOR HOUSE, NORMANTON-ON-THE-WOLDS | 193 |
| LIGHTING, HEATING, AND VENTILATION:— | |
| THE HEATING AND VENTILATION OF MUNITION FACTORIES | 194 |
| GAS APPLIANCES AND THE WAR: FUTURE PROSPECTS | 195 |
| HEATING WATER BY GAS: THE EFFECTS OF THE FAULTY HOT-WATER APPARATUS | 196 |
| THE BUILDING TRADE:— | |
| THE PLUMBERS' COMPANY | 200 |
| NEW GOVERNMENT CONTRACTS | 202 |

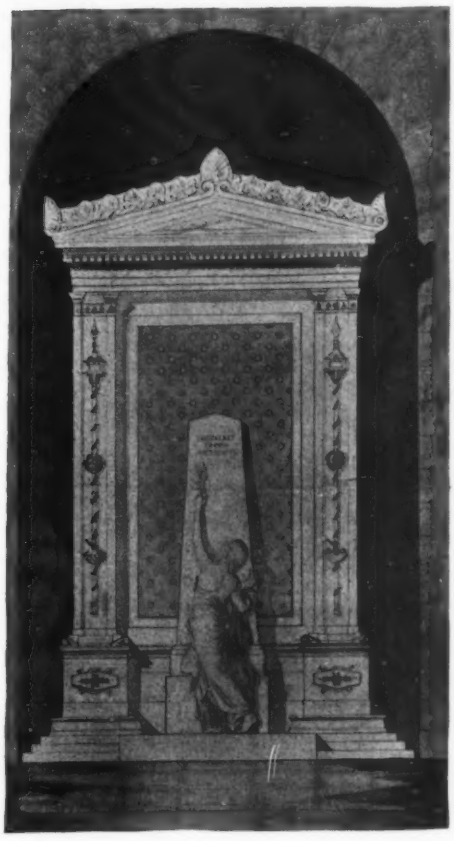

## ILLUSTRATIONS.

### The Pumps of London.

THESE illustrations are given in connection with the article on "The Pumps of London," which appears on p. 184.

### Liverpool School of Architecture Students' Work.

ON p. 185 an article is given descriptive of the exhibition of the work of the Liverpool School of Architecture, and the illustrations we give this week are referred to therein.



Liverpool School of Architecture: First-Year Work. By Mr. A. C. Holliday. (*See page* 185.)

### Cottage, Normanton-on-the-Wolds.

THIS cottage is done in half-timber work. The roof is tiled. The accommodation is as follows:—

*Ground Floor.*—Kitchen, scullery, parlour, larder, coals, water-closet.

*First Floor.*—Three bedrooms, bathroom, and water-closet. The cost was about £530, and the contractor was the late Mr. Vickerstaff, of Radcliffe-on-Trent, Notts.

## FIFTY YEARS AGO.

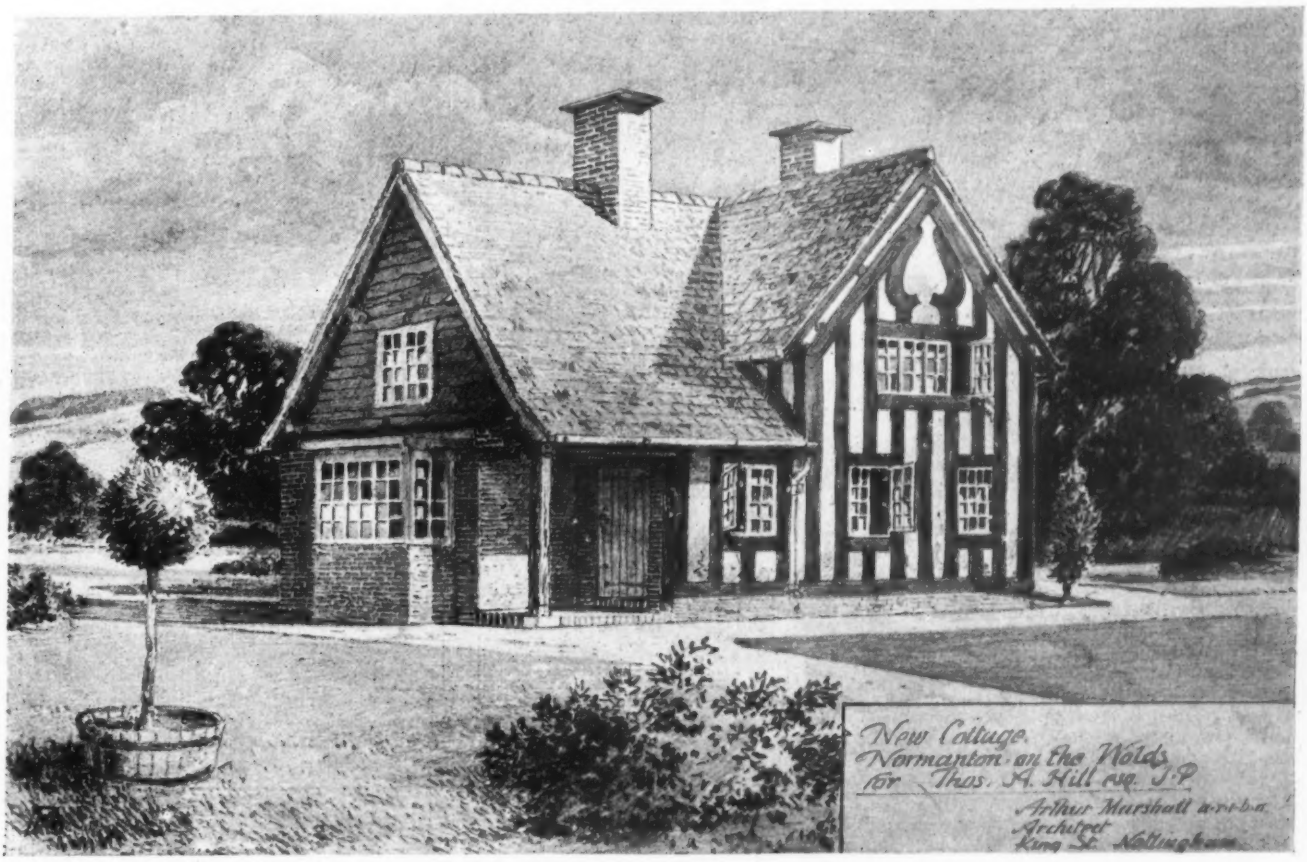
### Condition of Liverpool.

THERE is one significant sanitary difference betwixt London, Liverpool, and Manchester in connection with main sewers and drains. In London the main sewers are abundantly ventilated. In Liverpool and in Manchester there is no such arrangement for ventilating the main sewers, as any person may verify by walking along the streets. All over the surface of the London streets ventilating grates open up the sewers to the air above, so as to allow the sewage gases to be continuously diluted. This, although a rude method of sewer ventilation, has been the salvation of London. The 1,500 miles of sewers have the sewage-gases regularly and continuously diluted, reducing the evil in proportion to the cube of the space and the motion of the surface atmosphere. In Liverpool and Manchester for want of ventilation sewage-gases may be concentrated until a deadly strength is attained. The main difference betwixt London and all other great towns, however, consists in the absence of cesspits and night-men in London, and their continuance in Manchester, Liverpool, Sheffield, Leeds, and most of the other large towns of the North. The full meaning of "cesspit" and "nightmen" can only be understood and appreciated by those who have experienced and *felt* the all-pervading horrible stench. Words cannot describe the sensation. The weekly returns of the Registrar-General, however, show some of the deadly results.

[*** From the *Builder* of September 29, 1866.—ED.]

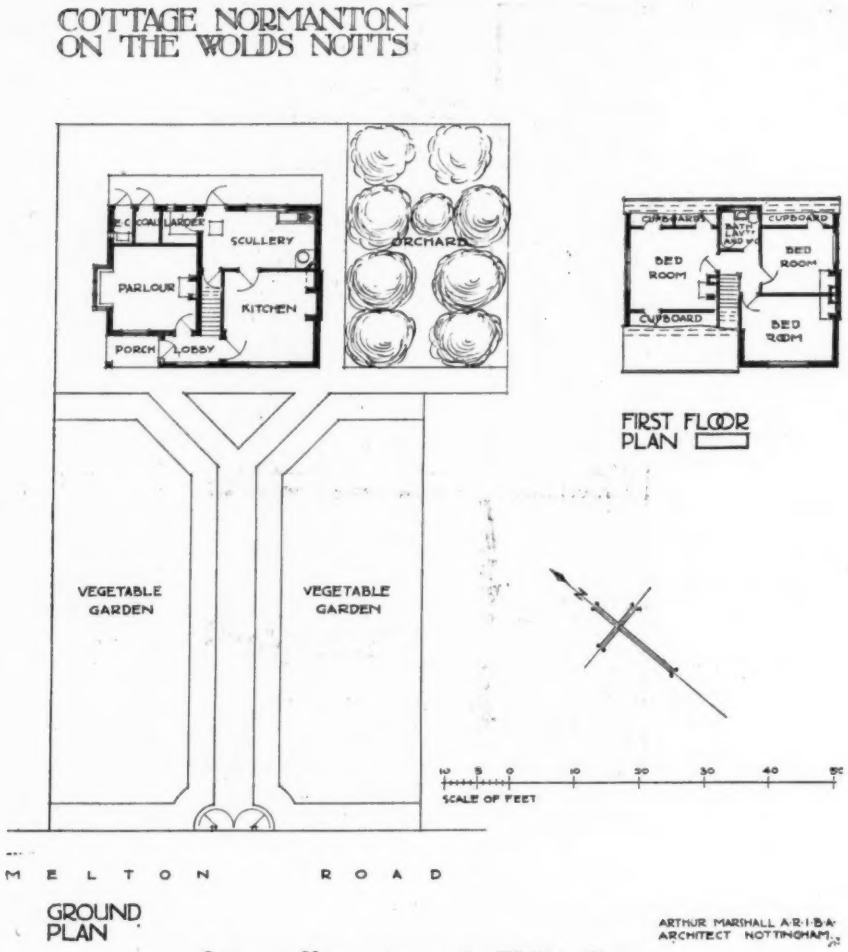
THE LATE MR. T. K. GREEN'S ESTATE.

Mr. Theodore Knolles Green, A.R.I.B.A., of No. 2, Ellerdale-road, Hampstead, N.W., and No. 70, Finsbury-pavement, E.C., architect and surveyor, who died on June 23 last, has left estate to the gross value of £19,140.



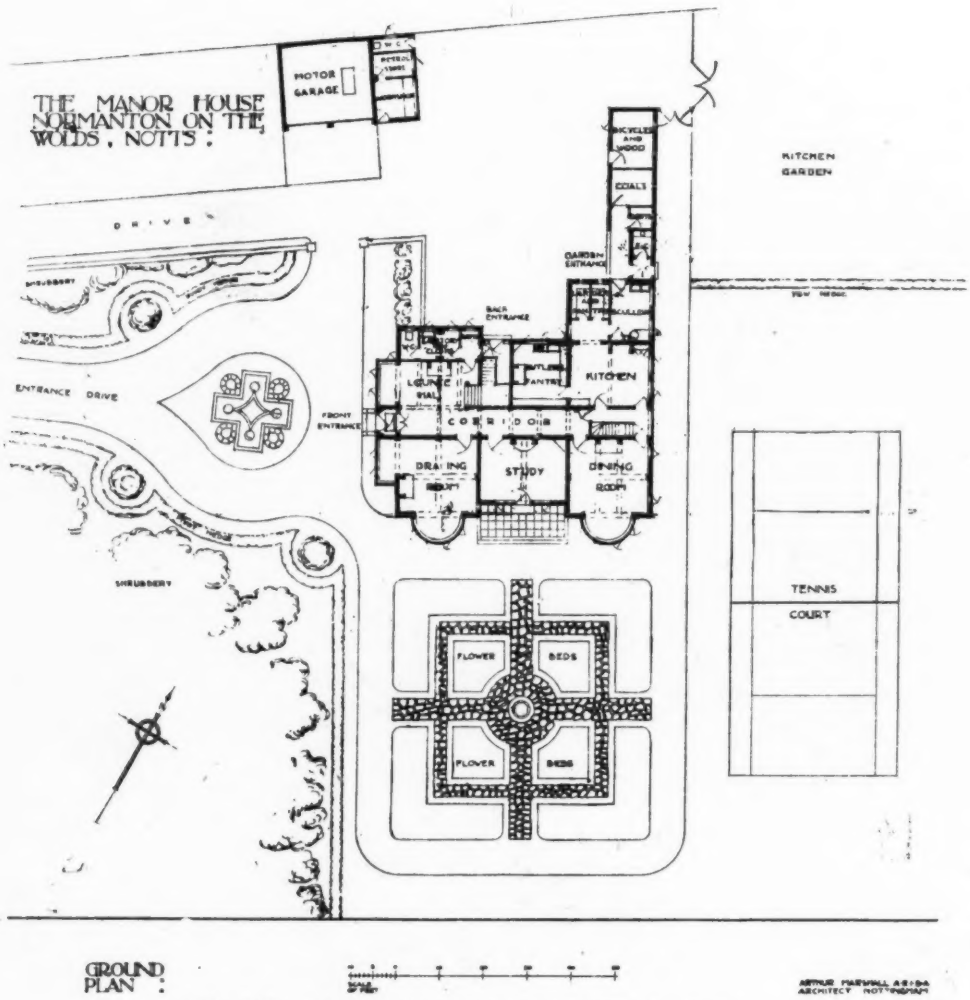

**Cottage, Normanton-on-the-Wolds, Notts.**

The Late Arthur Marshall, A.R.I.B.A., Architect.




**Cottage, Normanton-on-the-Wolds, Notts.**

The Late Arthur Marshall, A.R.I.B.A., Architect. (*See page* 191.)




**The Manor House, Normanton-on-the-Wolds, Notts.**

The Late Arthur Marshall, A.R.I.B.A., Architect. (*See page* 193.)

CORNHILL.

OLD LONDON PUMPS.—FROM DRAWINGS BY MR. HANSLIP FLETCHER.

ALDGATE.

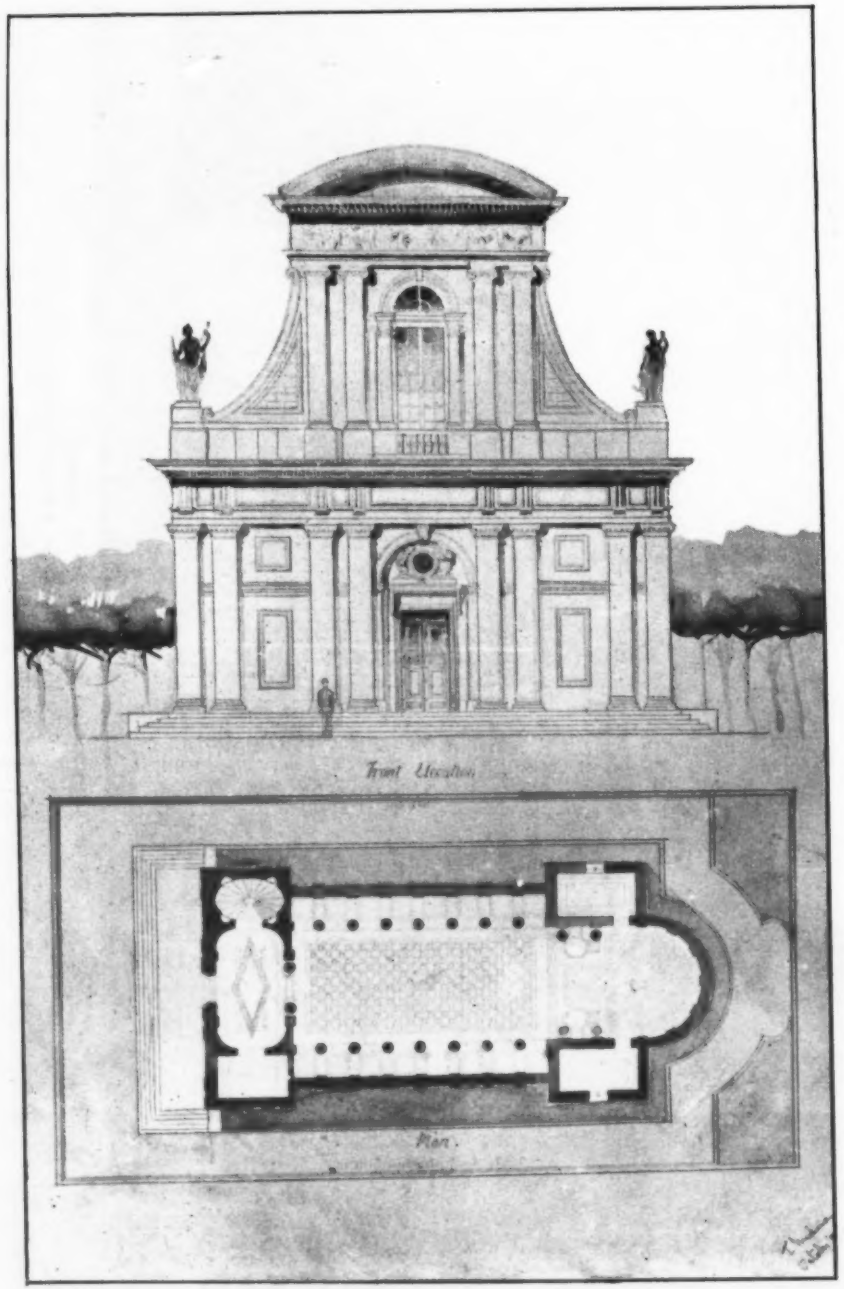
OLD LONDON PUMPS.—FROM DRAWINGS BY MR. HANSLIP FLETCHER.

QUEEN SQUARE.

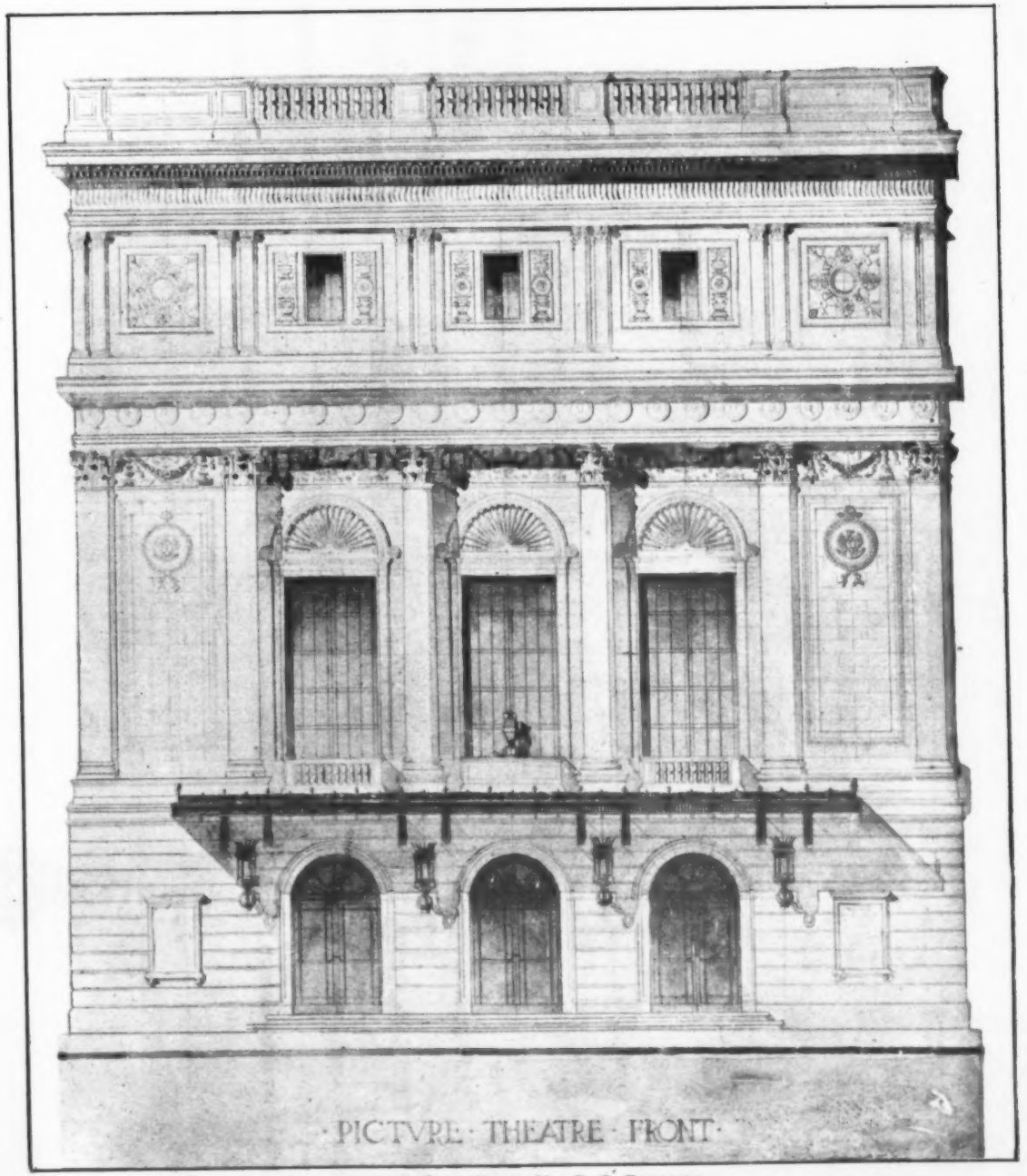
OLD LONDON PUMPS.—FROM DRAWINGS BY MR. HANSLIP FLETCHER.

JOCKEY FIELDS, GRAY'S INN.

OLD LONDON PUMPS.—FROM DRAWINGS BY MR. HANSLIP FLETCHER.

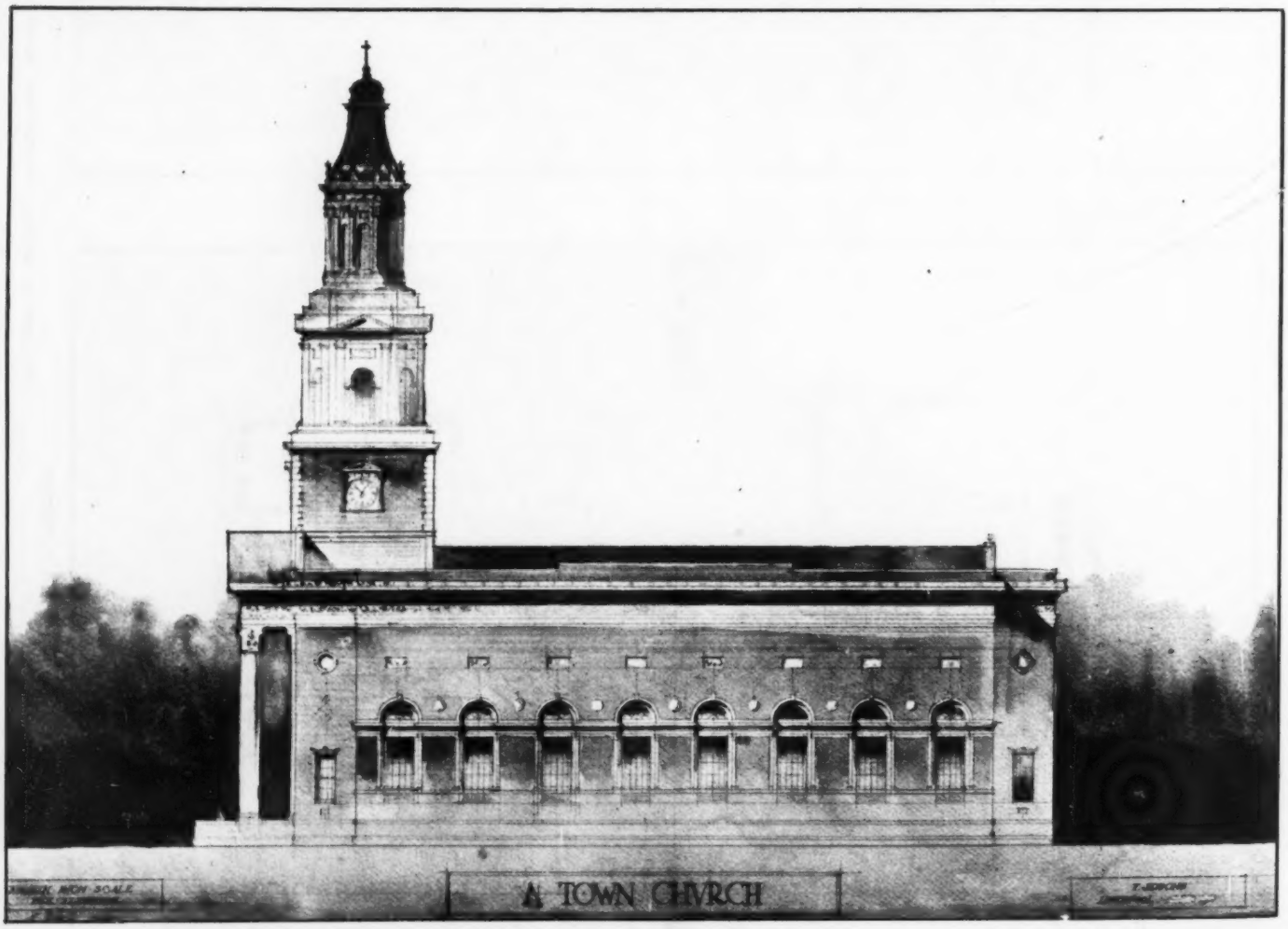



FIRST YEAR WORK, BY MR. T. MEDINA

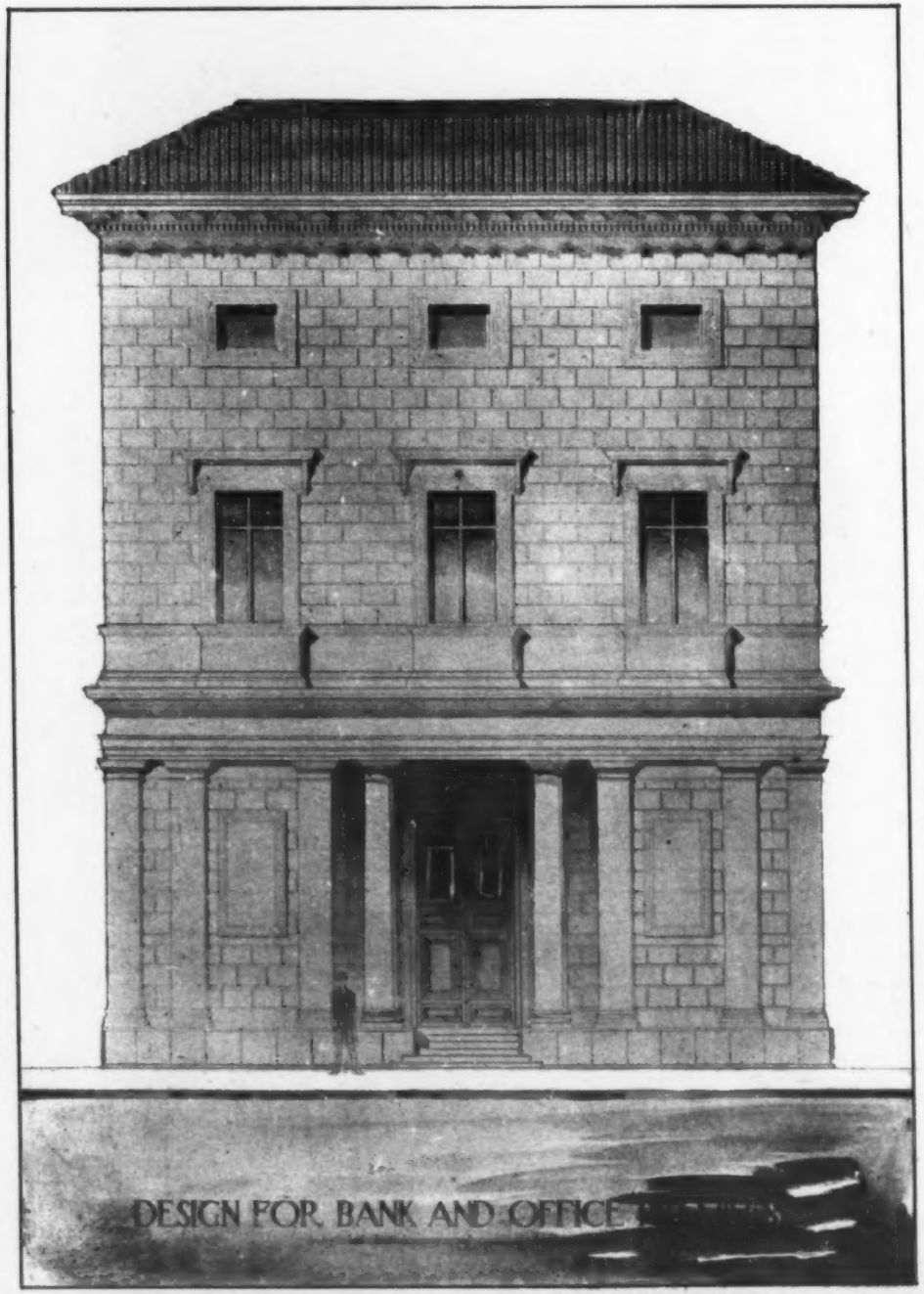



SECOND YEAR WORK, MR. S. C. FOULKES.

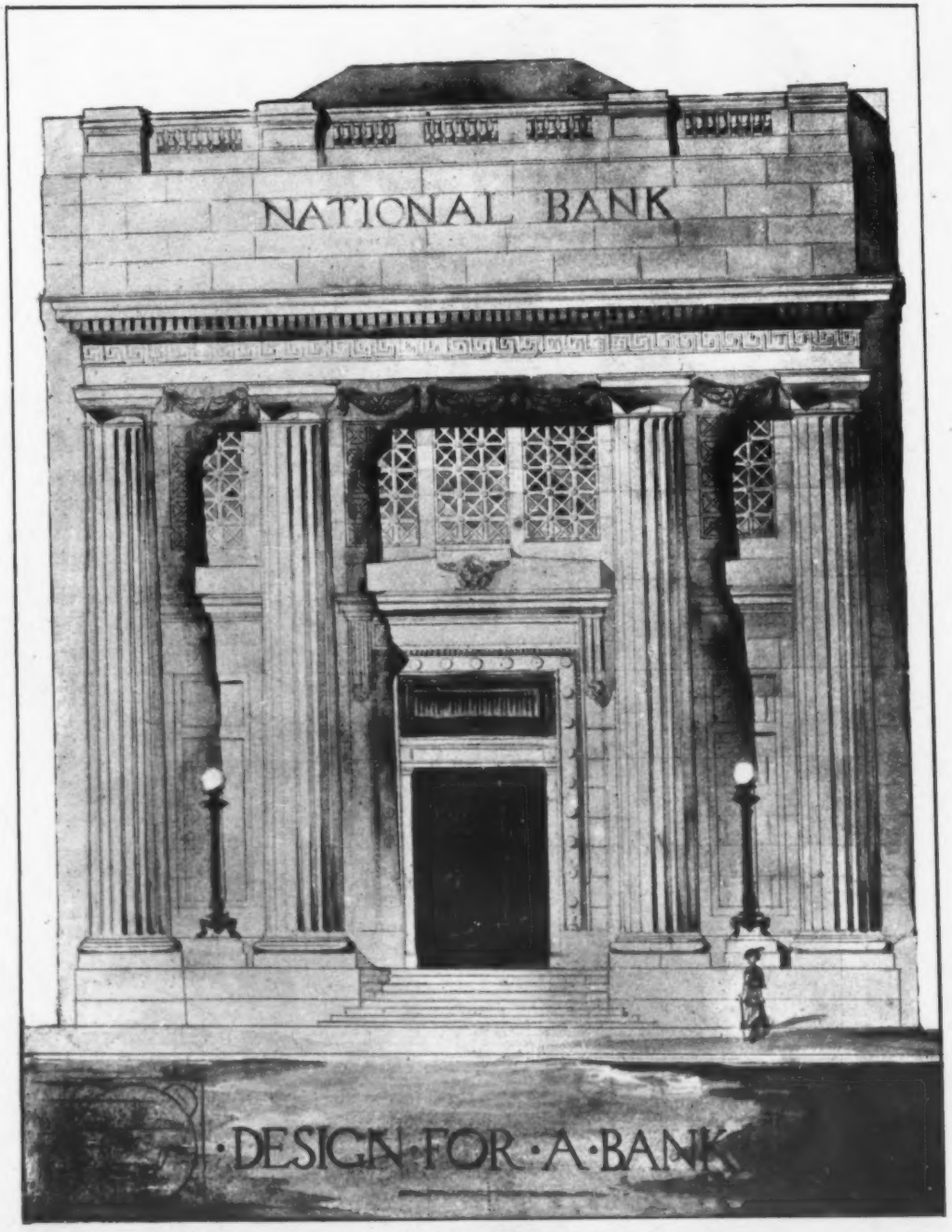
STUDENTS' WORK, LIVERPOOL SCHOOL OF ARCHITECTURE.




DIPLOMA PROBATION WORK, BY MR. F. JENKINS.
STUDENTS' WORK, LIVERPOOL SCHOOL OF ARCHITECTURE.

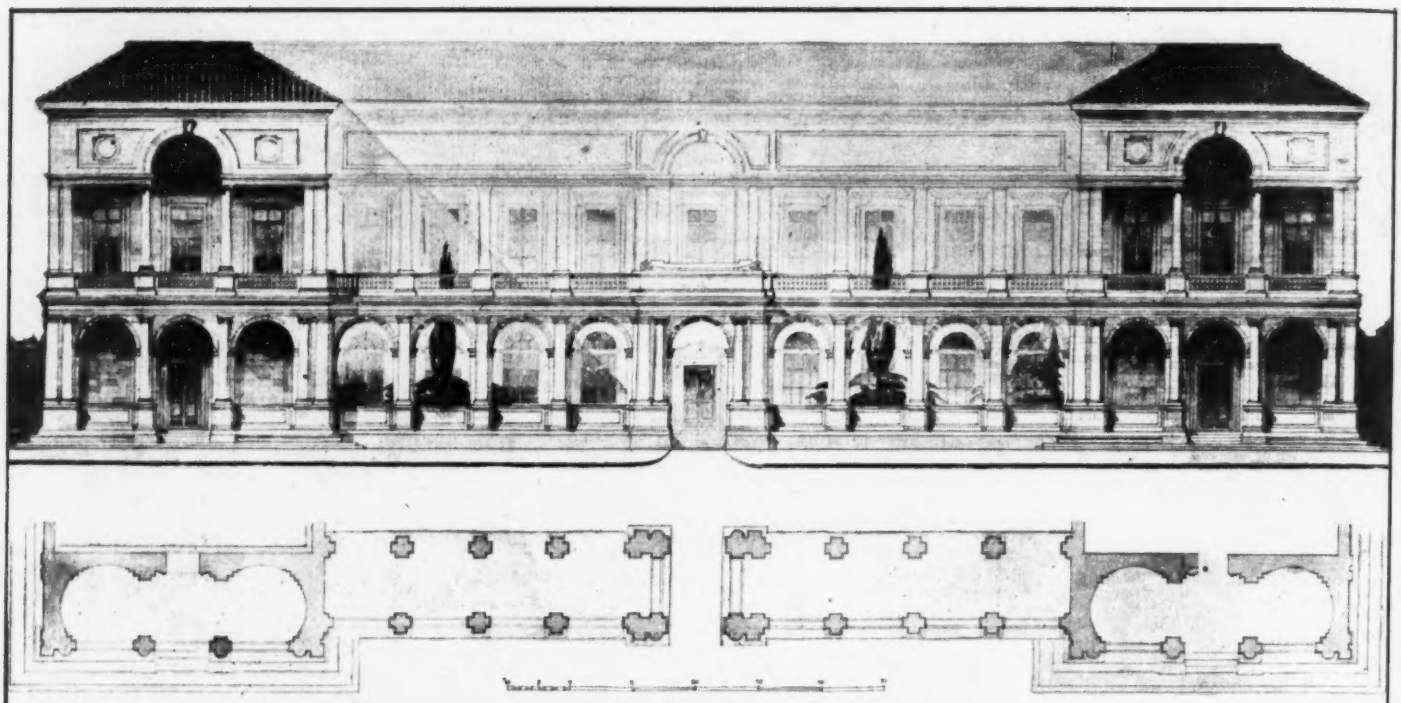



FIRST YEAR WORK, BY MR. T. MEDINA.



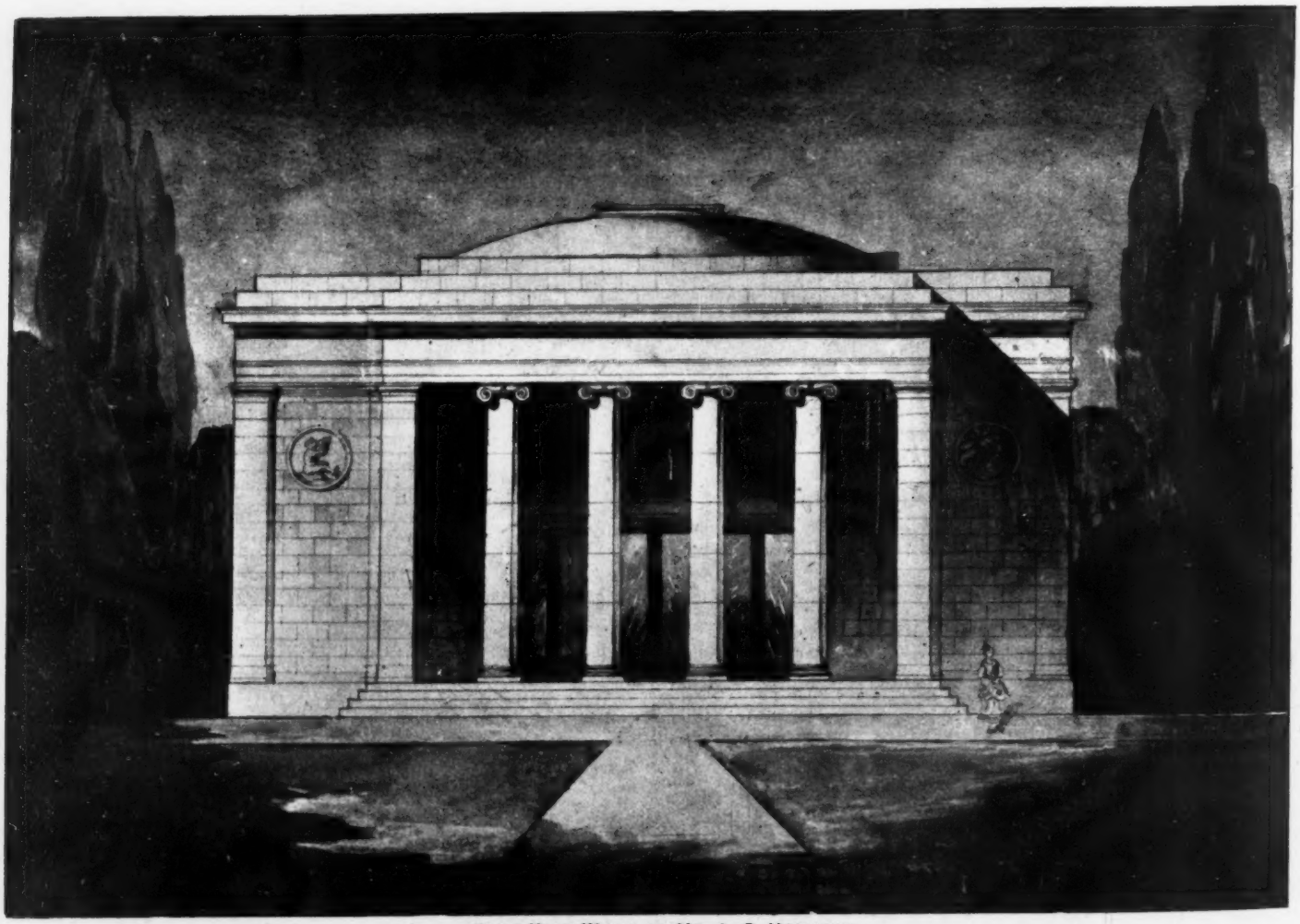

FIRST YEAR WORK, BY MR. A. C. HOLLIDAY.

STUDENTS' WORK, LIVERPOOL SCHOOL OF ARCHITECTURE.



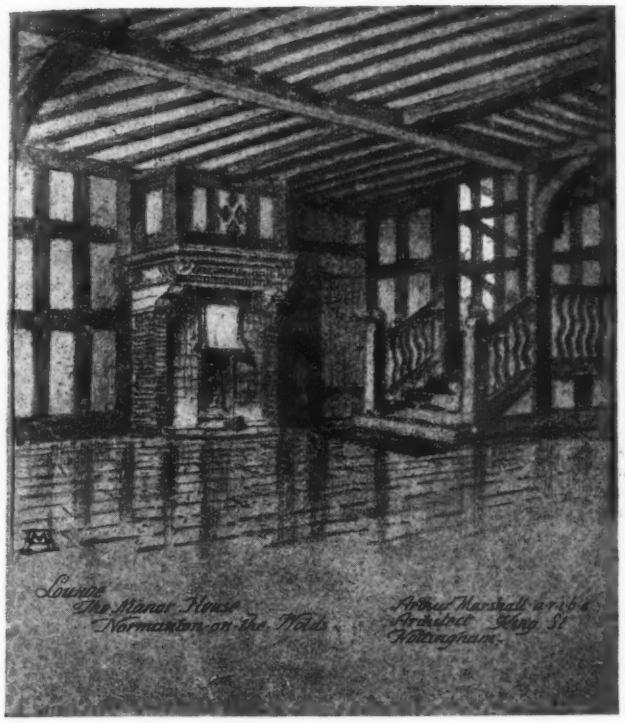
·DESIGN FOR FACADE AND COLLONADE SCREEN·

FIRST YEAR WORK, BY MR. W. M. RUSHWORTH.

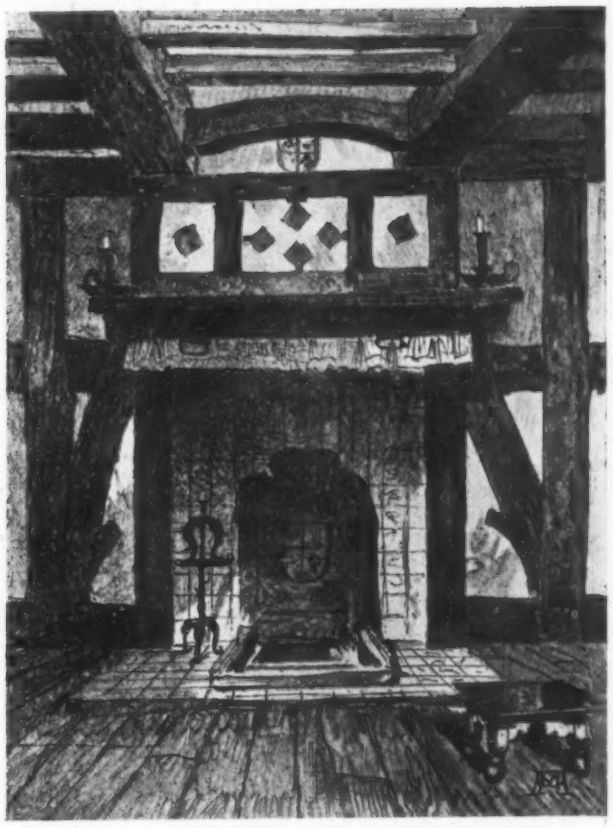


FIRST YEAR WORK, BY MR. A. C. HOLLIDAY.

STUDENTS' WORK, LIVERPOOL SCHOOL OF ARCHITECTURE.




Lounge.



Fireplace in Lounge Hall.

**The Manor House, Normanton-on-the-Wolds, Notts.**

## THE MANOR HOUSE, NORMANTON-ON-THE-WOLDS.

THIS house is executed in the old style. The bricks are Messrs. Tucker & Son's sandstock and rustic-facing bricks. The walls on the interior are oak-panelled and oak-framed. The fireplaces are in the Adam and Jacobean styles. The roof is covered with Staffordshire hand-made tiles. The contractor was Mr. John Greenwood, Mansfield, Notts. The cost was about £4,000. The accommodation is as follows:—

*Ground Floor.*—Lounge hall, drawing-room, dining-room, study, kitchen, butler's pantry lavatory and water-closet, cloaks and store scullery, larder, pantries, outbuildings (coals etc.).

*First Floor.*—Nine bedrooms, bathroom, water-closet, linen.

*Second Floor.*—Box-rooms.

**The Manor House, Normanton-on-the-Wolds, Notts.**

The Late Arthur Marshall. A.R.I.B.A., Architect.

# LIGHTING, HEATING, & VENTILATION.

## THE HEATING AND VENTILATION OF MUNITION FACTORIES.

### Introductory.

THE efficient heating and ventilation of all factories is absolutely necessary if the maximum output is to be obtained, as the health of the workers must be maintained, and the initial outlay, together with the annual cost of running the apparatus, will be more than repaid to the employer who studies the comfort of his employees by providing healthy workshops. Even in the most successful types of factory buildings the large numbers of workers employed in one apartment, together with the heat generated by motive-power and plant, and the smell given off by the materials, render some system of induced ventilation necessary, especially in cold weather, when the natural ventilation is often partially or totally suspended by the closing of windows and skylights.

### War Conditions.

At the present time the conditions of war have the effect of rendering the subject of even greater importance than in normal times for the following reasons:—(1) The work is carried on in factories at a greater pitch and working hours are longer; (2) a great deal of female labour is employed, and this calls for better conditions; (3) the shortage of labour generally makes it essential to avoid sickness wherever possible, as workers cannot easily be replaced; (4) many of the buildings used for munition work were not designed for the purpose and are therefore far from ideal.

In face of all these reasons for dealing with the subject there is the need to economise in every possible direction, both in material and labour, and in addition the designer will experience difficulty and delay in getting even those essential parts of his apparatus which require any sort of skilled labour in execution, as the energies of the industrial world are entirely devoted to the production of actual machines of war, and the equipment of any building is compelled to take second place.

A building can be used without the heating and ventilating systems being completed, and this is often the case at the present time, which fact renders it necessary to keep every system as simple as possible consistent with efficiency in order that the scheme may be completed speedily and the maximum benefit accrue from its installation before the health of the workers is affected. More especially in buildings of a temporary character is this essential, because the life of the structure is likely to be a short one, and once the war is over demolition will follow, with the consequent "scrapping" of any installation within the building.

### New Problems.

One of the most striking features of building work during the past two years has been that the class of structure erected in nearly every instance is such that new problems have been presented to the designer. It is quite true that in ordinary times of peace no two buildings present exactly the same features, and the architect is faced with conditions more or less different from those met with before; but in the case of munition factories an entirely new field of design has been entered upon, and preconceived notions have had to be considerably modified to meet the exceptional circumstances. Architects and engineers have, however, risen to the occasion, and the new problems have been tackled in a spirit which reflects credit upon them.

It is quite obvious that the majority of designers had practically no experience of explosive factories, as the work in the past was very limited and confined to a few specialists; while there is no published matter that is available to those outside Government departments. The vast amount of work to be done, however, necessitated the employment of many persons who were not specialists in the subject, and thus considerable ability was required in producing satisfactory schemes at short notice. Again, there are cases of quite new types of buildings which have to be erected for new processes and wonderful explosives which have been invented since the war began, and for which absolutely no data existed.

In the last mentioned in particular the heating and ventilation schemes have presented unique problems, and it would be extremely interesting if some actual details of specific cases could be given, but this, of course, is impossible, as it might result in some information being given to our enemies, which is the last thing desirable.

### Heating.

The heating of munition factories is a matter which requires considerable care, owing to the absolute necessity for avoiding any possibility of sparks which would cause fires and explosions. At the same time efficient heating is absolutely necessary in many cases, as a uniform temperature must be maintained in order that various processes may be successful, and, as this temperature is often one which is excessive as regards the comfort of the workers, efficient ventilation must be provided in conjunction with the heating. Ordinary coal fires can be considered at once as being practically impossible in nearly all cases, and, although gas fires can be adopted in some instances, these cannot be looked upon as a method of heating large apartments in such buildings, even when there is no risk of explosion in the immediate vicinity and a gas supply is available. They are, of course, quite suitable for offices and such-like when they occur in a building detached from the main factory. Hot-air heating is not generally employed in munition factories. The alternate methods are electric radiators, hot water heating, steam, and various gas appliances. Of these, electric radiators, although perfect as regards cleanliness and convenience, are often expensive when required in large numbers, even if the current is generated in a power-station which forms a part of the factory buildings, and for this reason they are not extensively employed. A supply of steam is practically always available in a large factory, as it is required for many purposes, and with a complete installation of mains about the building it offers a simple solution of the heating problem. Steam pipes can be carried round skylights and radiators provided under the windows, and with a properly-designed system the heating can be regulated to a nicety. In some types of factories the work is divided up into distinct operations, which have to be carried out in distinct and separate buildings, and these buildings are often so scattered that it renders it very difficult to deal with the heating under one scheme, while any attempt to deal with each one separately becomes an expensive matter, as it necessitates the duplication of the primary source of heating. With the use of steam as the heating medium it is possible to carry the mains for some distance, but it frequently happens in establishments of this kind that what may be described as a composite system is used—*i.e.*, steam is used for the main buildings and hot water, gas, electric radiators, and even coal fires are used in smaller separate buildings, according to the suitability of the system and the sources which are actually available in each particular position. A great deal depends on the nature of the power which is being used in the factory, the arrangement or grouping of the buildings, and the class of work which is being produced, and it is quite impossible to state any fixed rule as to the system that should be adopted in the numerous munition factories which are now in being or in course of construction. In temporary buildings the heating is usually a difficult matter, as the outlay required for a complete and efficient installation is often prohibitive, and the nature of the construction of the outer walls and roof is such that there is a great loss of heat and more units are necessary to produce a constant uniform temperature. There is also a difficulty in maintaining a healthy temperature, and the feeling in either one of insufficient warmth or excessive heat according to the general arrangement of the building and the outside weather conditions.

In newly-erected buildings of the more permanent character it is an excellent method to use hot wall panels, which are constructed with small pipes embedded in the plaster, as these give a pleasant efficient warmth and have the advantage of helping to dry the building quickly—a distinct consideration in these days of early occupation after completion. This system will not, of course, be applicable to numerous buildings of the factory type, as the walls are left unplastered; but in such cases the pipes can be laid in the floor material, and this method assists in keeping the feet warm during the winter. It is an absolute necessity to provide some system of heating in every factory building, and the essential factors are that the outlay should not be excessive; it should be simple and easily regulated, and it should be such as will produce a pleasant heat. When installed in new buildings it should be completed as soon as any of the services, in order that the apparatus may be put in operation and the heat used in assisting to dry out the moisture that is inevitable in all new structures.

### Ventilation.

As previously stated, the ventilation of all munition factories must of necessity be dealt with in conjunction with the heating, and the two are inseparable if the building is to be successful. The ventilation system must be one which can be controlled and regulated to perfection, because it will not be efficient if this is not the case. With munition factories the varying conditions, which offer such difficulties when dealing with heating systems, apply equally forcibly to the question of ventilation. Natural ventilation has been partly resorted to in many cases, and when provided with some kind of controlling arrangement it has proved satisfactory; but this generally applies to small apartments and in instances where no poisonous or dangerous fumes are given off. Extract ventilators for drawing air through the roof and similar devices have probably been in greater demand during the past two years than for many years previous, and the several excellent types which are on the market have given great satisfaction. The respective merits of forcing in the fresh air and allowing the vitiated air to escape through outlets owing to the increased pressure, or of drawing out the vitiated air with fans and allowing the fresh air to be sucked in at certain arranged inlets, have been discussed many times, and each system has its adherents; but in the case of munition factories it has frequently happened that the designer has had to face conditions which do not permit of any choice, and he has been forced to adopt whichever of the two systems is practicable.

In explosive factories there are frequently rooms which either have to be heated to an excessive temperature on account of the process being carried on or the mere fact of the process being in operation causes an excessive heat to be generated, and it is with these rooms that the ventilation scheme has chiefly to deal. Where no unpleasant fumes are generated it is possible to give a supply of fresh air to the rooms and draw the warm air through other apartments, and thus take advantage of what would otherwise be waste heat. When one portion of the building is considerably higher than the remainder this can sometimes be used as a natural upcast for the warm air and a very simple and cheap scheme will result. In those rooms where dangerous fumes are generated the ventilation becomes a more difficult matter, as it often happens that these fumes will attack and quickly destroy any extract fans that are installed, and the only method to adopt in such instances is that of neutralising the fumes before the fans are reached.

This neutralisation will be accomplished by drawing the air through specially-constructed pipes and chambers wherein an agent is

# BASEMENTS

## WHICH HAVE BAFFLED

**all attempts to stem the flooding have been made bone-dry with Pudloed cement concrete and plasterings.**

**WALLS in which the damp courses have perished, walls surrounded by moist earth, and exposed walls subjected to driving rains, have always been made perfectly damp-proof with a Pudloed cement rendering given either inside or outside the building.**

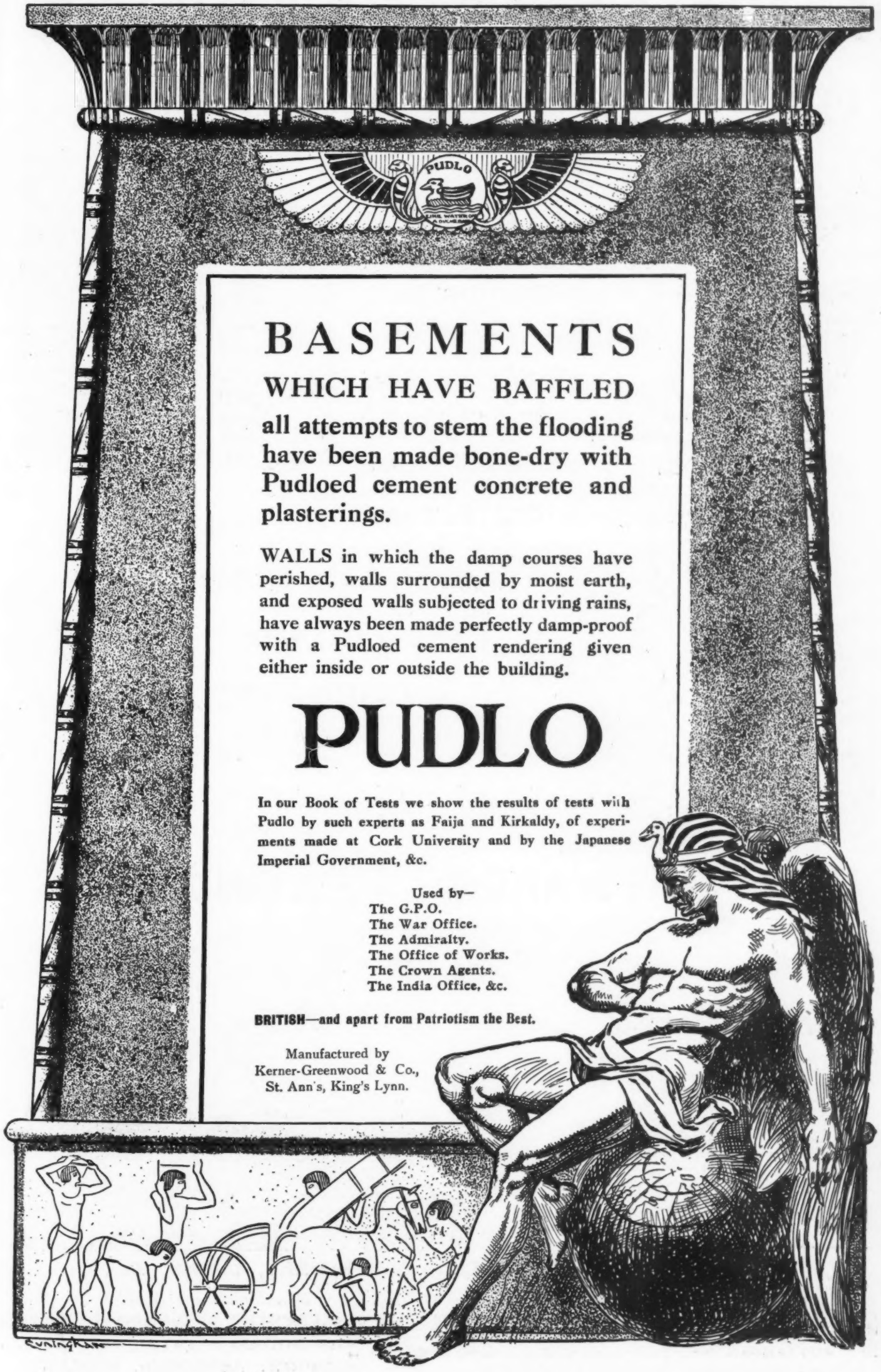
# PUDLO

**In our Book of Tests we show the results of tests with Pudlo by such experts as Faija and Kirkaldy, of experiments made at Cork University and by the Japanese Imperial Government, &c.**

**Used by—**
**The G.P.O.**
**The War Office.**
**The Admiralty.**
**The Office of Works.**
**The Crown Agents.**
**The India Office, &c.**

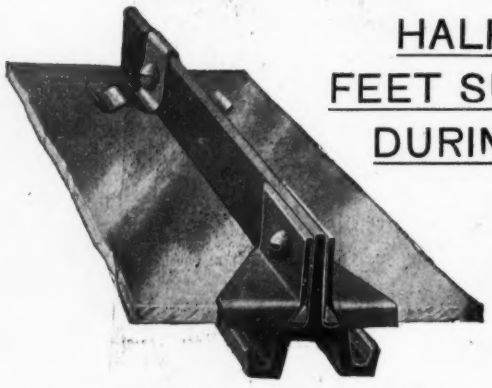
**BRITISH—and apart from Patriotism the Best.**

Manufactured by
Kerner-Greenwood & Co.,
St. Ann's, King's Lynn.



# HAYWARDS GLAZINGS, ETC., For MUNITIONS BUILDINGS.

## "REFORM" PATENT ROOF GLAZING.

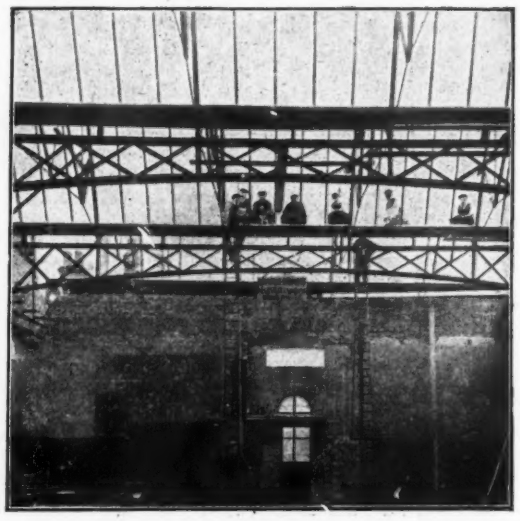


HALF A MILLION FEET SUPER. SUPPLIED DURING THE WAR.

SIMPLEST, BEST, 'DROP DRY.'
EASIEST TO FIX AND REPAIR.

STANDARD STEEL LANTERNS.

STEEL SASHES.



ABSOLUTELY RELIABLE.
QUICKEST DELIVERIES.

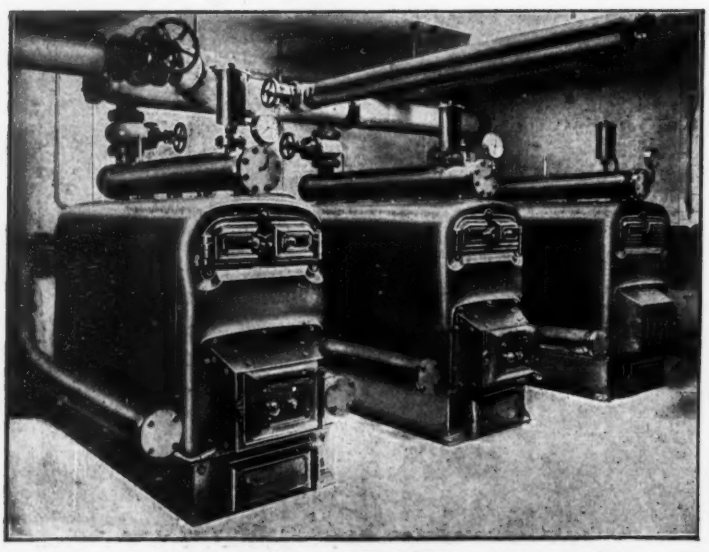
FACTORY ROOFS. NORTH LIGHTS.
AERODROMES. SKYLIGHTS.

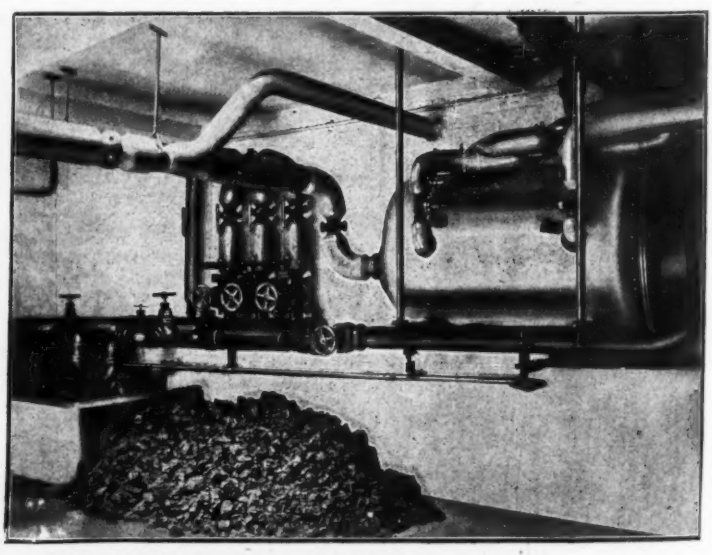
## HAYWARDS IRON FIRE-ESCAPE STAIRCASES.

This photograph shows **Actual and Severe Test** of Haywards Iron Fireproof Escape Staircases, thus **realising** the **best guarantee** of excellence of construction and sterling worth that it is possible to obtain.

Haywards offer unrivalled experience in the construction and adaptation of Iron Staircases to all needs and circumstances. No trouble or expense is spared in manufacture, and moderate prices and best value are assured for all orders, large or small.

## HAYWARDS HEATING.





INSTALLATIONS OF BOILERS, CALORIFIERS, MAINS, Etc.

**HAYWARDS LTD.** Engineers & Ironfounders

187-201 Union St., Borough, London, S.E.
Telephones: Hop 3642 (3 lines). Telegrams: "Hayward Brothers, London."

*Branches and Agents at—*
MANCHESTER, LIVERPOOL, LEEDS, BIRMINGHAM, BRISTOL, NEWCASTLE, GLASGOW, ABERDEEN, DUBLIN.

employed to suit the particular gas or fumes which are to be treated. It must also be remembered that it is not permissible to discharge large volumes of vitiated air which may contain a large percentage of fumes or gas of an explosive nature, as the contact of sparks from a neighbouring furnace or fire would cause serious results.

In the laboratories the ventilation will obviously be a very important matter, and, in addition to the extraction of the vitiated air in the main rooms, it will be necessary to provide specially-constructed draught cupboards with suitable outlets in order that operations which produce obnoxious fumes may not affect the general work.

The effect of scattered buildings is not so difficult to overcome in the design and installation of the ventilation scheme as it is in the case of the heating system, because if mechanical ventilation is necessary the question of running small cables for electric power to drive fans is a simple one, and it frequently happens with scattered buildings that no mechanical system is required.

In addition to the actual working-rooms it must not be forgotten that rest-rooms and mess-rooms are usually provided for the workers, and in these the ventilation must be carefully considered. In the case of rest-rooms the temperature maintained should bear some relation to that in the working-rooms, as it is unwise to subject the workers to a sudden drop in the temperature when they cease work for a time. In the mess-rooms the tendency of the air currents should be directed towards the kitchens and not from the latter, as this will prevent the smell of cooking from penetrating the rooms to any extent.

There are many other points to consider in dealing with the scientific ventilation of factories, such as the portions where radiant heat is given off and the workers are engaged under very trying conditions. An excess of fresh cold air is disadvantageous in rooms of this kind, as it will be found that, if there is a continual supply of air which prevents the worker from perspiring, then the radiant heat will become even more intolerable. Exactly the same conditions will not be found in any two factories, and thus it is impossible to lay down any definite rules until the particular circumstances are known. In some buildings a certain scheme of ventilation is necessary to assist in the actual carrying out of the process; while in other structures the process is such that only the minimum ventilation which will enable the workers to continue is permissible. It therefore remains for the engineer to study the subject from the two aspects and endeavour to satisfy both conditions with sufficient margin for variation in order that any necessary adjustments can be made when the actual working conditions are in existence.

---

# GAS APPLIANCES AND THE WAR:

## FUTURE PROSPECTS.

THIS article does not deal in any way with the part that gas has played in the war—in connection with the production of high explosives and the enormous extension of the use of gas-fired furnaces, etc., in the general manufacture of munitions—though there is no doubt that had it not been for the wonderful improvisation of gas appliances in this direction the supply of munitions could not possibly have reached the present wonderful figures. Neither does the article deal with the successful application of gas as a source of heat for various trade processes, which previously were solely in the hands of Germans or Austrians, but are now being carried out—we hope for all time—by British manufacturers.

The above-mentioned features, while all important to the architect or builder from the point of view of the general welfare of the Empire, do not so intimately concern him in his professional or business capacity as does the rapid extension of the use of gas for cooking and water heating and the heating of buildings of all kinds.

It is true that the value of gas appliances as convenient and labour-saving devices was becoming increasingly realised in the years immediately preceding the war, and, as a consequence, their adoption in business premises, residences, etc., was rapidly extending; but there are signs that lead us to conclude that after the war the demand for gas appliances will be far greater than has ever before been experienced.

### Extensive Improvisation of Buildings.

One of the reasons for the optimism of those connected with gas undertakings is the prominent part that gas has played in connection with the improvisation of buildings—temporary or otherwise—for war purposes, such as canteens, hospitals, war supplies depôts, Red Cross buildings, internment camps, etc. It is claimed that more has been learned since the war as to the value of gas for the rapid, economical, convenient, and labour-saving production of heat for all domestic purposes than would have been possible otherwise in a far greater period.

In very many cases architects, builders, and their clients have found themselves with buildings to reconstruct that were never in the remotest degree intended for the purposes which they had suddenly been called upon to fulfil. Owing to the scarcity of labour the all-important thing to do was to provide suitable cooking appliances and an adequate and properly-distributed supply of hot water—in most cases enormously greater than it had been anticipated would ever be required in the house under reconstruction—with the minimum amount of constructive labour and structural alteration. The use of gas appliances in such cases has undoubtedly solved many a problem and enabled the architect and builder to hand over a completed building in far less time and with far less labour than would otherwise have been possible.

### Constructive Labour Saved by Gas Installations.

There have, of course, been thousands of cases in London and all over the Kingdom where buildings have been rapidly reconstructed or refitted for some purpose connected with the war, and as an illustration of what has been done by gas a few examples are quoted from many similar cases that have occurred within the writer's personal knowledge. A large house in the West-end of London, built and occupied as a private residence previous to the war, has been turned into a hospital accommodating over sixty patients. The coal range cooking accommodation was naturally hopelessly inadequate, as was the hot-water supply and bathing accommodation. It will readily be realised how difficult—nay, almost impossible—it would have been to have provided the necessary labour for the setting up of adequate coal or coke range cooking appliances and to carry out the extensive alterations to the water-heating system, which, unless gas were installed, would have been unavoidable. Gas cooking stoves were rapidly and easily fixed, and instantaneous gas water-heaters were installed to supply the sinks, three baths, and eight lavatory basins, all these draw-offs being in almost continual use, necessitating a constant supply of really hot water day and night.

A large hospital, having built extensions, as so many others have done during the war, thereby increased its capacity to nearly double the normal number of beds, and in order to cope with these as regards cooking, water heating, and general heating extra gas appliances were accordingly installed. But, as the staff of nurses had also to be materially increased, it was impossible to accommodate them on the premises, and therefore a number of dwelling-houses were acquired in the neighbourhood to be used as nurses' homes. Here, again, houses had to be improvised for purposes for which they had never been constructed. For convenience, rapidity, and saving of constructive labour, gas cooking, water heating, and heating appliances were therefore quickly installed. A lecture hall of a large school was turned into a kitchen to cook for 150 people. There is perhaps no need to mention that in such a case the alterations necessary for the installation of coal or coke cooking accommodation were very extensive, and with labour so scarce it was practically impossible—even if time would have permitted—to carry these out. Gas cooking appliances, etc., were therefore installed throughout.

The above remarks have dealt principally with water heating and cooking accommodation, as any great increase in the normal demand for these in a building naturally necessitates a great amount of work in alterations, and it is no disparagement to other forms of apparatus to say that in the circumstances they could not have been installed without an increased amount of labour being employed, or so rapidly and cheaply as those in which gas was the heating agent.

### Gas Installed to Heat the Buildings.

Gas fires and other forms of gas heating have also been largely adopted to warm a great number of the buildings improvised for war purposes.

### Saving in Domestic Labour an Important Factor.

This brings us to another reason for the installation of so many gas appliances in what might be called "war buildings," quite apart from the saving in labour and cost in fixing them, and the reduction in structural alterations. The great saving of domestic labour owing to their use is perhaps of even more importance than any other aspect of the situation. It is not overstating the case to say that a great amount of labour would have necessarily been incurred in many cases which could be mentioned if coal or coke had been used instead of gas for cooking, heating, and water-heating purposes, and it would have been difficult to obtain the requisite additions to the working staffs. In such cases, therefore, the use of gas has undoubtedly enabled a large amount of labour to be diverted to more useful channels.

It might be said here that the great opportunity which the war has afforded to gas to show what it can do, and which the supporters and suppliers of gas have so readily seized, is purely a temporary matter, and that after the war the improvised buildings will return to their normal state, the gas appliances will be removed, and the original conditions will again return.

### What of the Future?

It is undoubtedly quite correct that many—though very far from all—of these gas appliances will be removed after the war, as is quite natural when it is borne in mind that the demands of the institutions or households will then be so enormously decreased. But will the effect and impression that has been made by the fact that gas and gas appliances have so readily and satisfactorily filled a serious emergency also be removed? We do not think that this is in the least degree likely.

Architects and builders and their clients have had so many instances brought to their personal notice of the rapidity with which gas appliances can be adapted to the needs of the moment, and will have had such object-lessons in their convenience and economy and also their cleanliness and labour-saving qualities, that gas will undoubtedly be specified for in far more cases in the future than in the past.

### Permanent Buildings.

Again, up to now we have only discussed temporary buildings, but a number of *permanent* buildings erected or in course of erection during the war, such as hospitals, factories, office buildings, etc., have had large numbers of gas appliances installed or specified for that will remain permanent fixtures after the war. As an instance of this, taking *permanent* hospitals alone, one large gas undertaking fixed for such institutions during the past year more than 450 gas fires, cookers, and water-heaters. One London hospital at the present moment is having all its coal grates removed and gas fires fitted to tiled backs instead.

Here it is perhaps pertinent to refer to an article that appeared in the *Builder* of September 24, 1915, entitled "Gas Fires and Economy in Building." This article referred to the increasing tendency to fix gas fires throughout new buildings when these are built instead of first installing coal grates and afterwards (more or less artistically) to adapt gas fires to them.

There is no question that this policy is beginning to extend and that developments are imminent in the near future. We refer to such developments in building as the use of shallow ventilating shafts or circular flue pipes, sufficiently large to permit of the removal of the comparatively small quantity of vaporous products of combustion from the amount of gas necessary to heat the rooms, while assisting their ventilation, rather than the construction of the wider brick flues hitherto necessary for the removal of smoke and the more dense products of combustion from coal. The installation of such shallow shafts or pipes would undoubtedly lead to economies in building, and, what is perhaps equally important, would increase the available floor space in rooms owing to the partial or entire elimination of deep and wide chimney-breasts. The space occupied by coal cellars would also be available for other and more useful purposes.

Among other similar cases we hear of a large association which is having new headquarters built in which there will be no coal grates, over fifty gas fires being installed instead, these being built into position against tiled openings; and in the case of a block of City offices about to be built all gas fires and the shallow ventilating shaft system are being contemplated.

### All-Gas Houses.

There is a notable increase also in the erection of what are known as "all-gas houses"—that is to say, houses in which coal or coke play no part whatever, gas being used throughout for cooking, heating, and water heating. In a large Midland town there are over 500 "all-gas houses," and many of them are to be found in London and other parts of the country. The domestic labour problem and—in flats especially—the difficulties attendant upon the storing of coal and the disposal of ashes, etc., will undoubtedly lead to further increases in this direction.

### The Kitchen Refuse Problem.

Since the war, owing to the difficulties met with by local councils in providing sufficient labour to promptly remove kitchen refuse, increased attention has been drawn to the menace to health attendant upon the retention in receptacles of garbage in various stages of decomposition. We hear of the dangers that lurk around the usual contents of a dustbin; but it must also be confessed that the interior of even an emptied dustbin that has recently contained kitchen refuse is by no means a thing of beauty or a hygienic object, the accumulated filth around the sides no doubt containing many millions of germs prepared to spread diseases of all sorts. Indeed medical officers of health in many parts of the kingdom have issued pamphlets advising the public to burn all kitchen refuse rather than to collect it, as dustbins containing garbage, apart from other disadvantages, are breeding-grounds for the pestilent fly. This advice is no doubt absolutely sound and valuable, but hitherto difficulties have arisen in carrying it out. The burning of kitchen refuse is usually a difficult problem, because during the summer months the majority of people seldom have their kitchen fires burning, and it is by no means easy to persuade them to light a coal fire solely to burn up a day's rubbish, even if the expense attendant thereon were not in most cases prohibitive. Indeed there are now thousands of houses, and especially flats, where there are no coal ranges in use at all.

In the case of flats the problem is more than ever acute, as will be readily realised when it is remembered that on a plot of land that might normally contain a dozen residences with their attendant dustbins a hundred flats may be erected, each one containing a refuse receptacle which contributes its quota of pollution to the surrounding air.

### Small Gas Refuse Destructors.

Of course there have always been gas refuse destructors, but hitherto they have been too expensive and too heavy and bulky to be adopted for the use of medium and small-sized residences and flats; but architects and builders will be interested to hear that small gas-fired domestic refuse destructors are now obtainable, which are fairly inexpensive, and will naturally be less so after the war. They are very simple in construction and quite convenient in size and capacity, and are suitable for fixing on the top of kitchen ranges, either for temporary use during the summer months only or as permanent fixtures. Where there are no kitchen ranges they may be fixed in the tiled recess that is now not an uncommon feature in a modern kitchen, or in a convenient position in kitchen or scullery, with a flue pipe carried from them to a chimney. We understand that several gas undertakings are already contemplating supplying them to their customers on hire at a small annual rental. This being the case, it does not seem unwise to prophesy that in the course of a few years the greater proportion of kitchen refuse will be burnt instead of being allowed to lie and rot in the present primitive and pestilent fashion.

### An Entirely New Heating and Ventilating Gas Appliance.

An apparatus has recently appeared on the market for which there will undoubtedly be a considerable demand in the near future. Though it does not so intimately concern the architect and builder as do most gas appliances for heating and ventilating, the mere fact of its being classed with these is sufficient to warrant its being specially mentioned on this occasion. We refer to the Gas Organ Heater and Ventilator, which, we understand, has been specially designed (and patented) to prevent the constant and rapid deterioration in tone and mechanical efficiency which has from time immemorial been experienced in connection with church organs.

It has been discovered that the principal cause of these troubles, including the sticking and breaking of wires, causing ciphering, etc., and the general disturbance of the working parts of these grand though delicate instruments, is the rapid and constant changes of temperature that occur throughout the inclement periods of the year in most of the buildings in which they are to be found.

The theory, which seems indisputable, is that the temperature of the air in a church or similar building that is only intermittently heated drops to a very low figure during the periods when it is partially or entirely unoccupied, but is rapidly raised when the heating system is brought into use and the congregation assembles, again to recede to a low figure when the doors are thrown open and they disperse. Apart from the bad effect of the cold and possibly the damp on the instrument during the unheated periods, the rapid rise and fall of the temperature mentioned above causes undue expansion and contraction of the working parts. And, what has an even more damaging effect, the temperature of the air of the building when it is heated and occupied increases far more rapidly and to a greater degree than the metal parts of the organ with which it comes into contact, with the inevitable result that condensation forms thereon, resulting in subsequent corrosion and premature destruction.

Whether this theory be new or old, the remedy has always been known, and that remedy is to keep the building constantly heated throughout the inclement periods of the year to prevent the cold and damp and—though this is said to be a new discovery—the rapid changes in temperature affecting the organ. But this remedy has usually been too drastic to suit the pockets of the authorities, as the cost of heating a whole building day and night for a great portion of the year in order to preserve an organ, even though it is a valuable instrument, has been far too big an item, quite apart from the fact that, unless the heating system has been run by gas (which is now frequently the case), the labour necessitated has been a serious drawback. It is claimed that the problem has now been solved by gas in the following way:—

### What the Gas Organ Heater and Ventilator Does.

An apparatus is installed which is capable of economically heating only the organ and its immediate surroundings, and in order that the heat shall not be rapidly dissipated into the other and major portion of the building it is applied in a ventilating form, hence the title of the apparatus, the Gas Organ Heater and Ventilator. When the apparatus is in use a stream of warmed air is led into and distributed over the internal parts of the instrument, and, as this movement continues during the whole time the gas is burning, the effect is really unceasingly to bathe the instrument with warmed air, thus preventing the delicate mechanism ever reaching the low temperature to which other portions of the building are subject. It will be readily realised that rapid expansion and contraction then cease and condensation can never form on the metal parts.

### The Apparatus Described.

The apparatus is a perfectly simple one, consisting of a gas-heater containing an upper and lower chamber entirely separated one from the other by a metal plate. A small gas burner, consuming from three to six cubic feet per hour, according to requirements, burns in the lower chamber, and the heat applied to the dividing-plate causes the air in the upper chamber to be heated; this heated air passes away into the organ through a duct or series of ducts, and as it passes away fresh air is automatically drawn into the upper chamber of the heater through slots provided therein, which slots may be regulated in size in order that more or less air at a higher or lower temperature shall be delivered into the organ. The small amount of products of combustion from the gas consumed is dispersed from openings at the sides of the lower chamber, which, as previously stated, has no communication with the upper or fresh-air chamber.

### Low Initial and Running Costs.

We understand that the apparatus should be kept burning day and night during the whole of the autumn and winter months, or, say, from the end of September to the end of March, and that it is quite inexpensive in initial and running costs and upkeep. It is quite simple to install, and has already been successfully applied to organs in churches and cinemas in order to preserve and keep in tone instruments that cost hundreds of pounds.

### Organs in Cinemas.

As the installation of organs in cinemas is now becoming fairly general, it would seem that there is scope for such an apparatus in these buildings, especially as the variations in their temperature are probably as great as in the case of churches and chapels, while occurring more frequently because the buildings are in daily use.

### A Successful Installation.

We know of one case where the apparatus has been in use for two years in a chapel with excellent results, having been applied to an organ that the organist had claimed was rapidly becoming unplayable, owing to the causes set out herein. Since the installation of the apparatus the organ has given no trouble whatever.

---

## HEATING WATER BY GAS:
## THE EFFECTS OF THE FAULTY HOT-WATER APPARATUS.

THIS article has reference to a difficulty which must be obstructing the progress of the gas-heated boiler or "circulator"—notwithstanding the large number now being installed—and which is apt to be detrimental to the character of this heater as a desirably economical and efficient appliance. As has been frequently stated, it is very unfair that a boiler should be blamed for the faults of the hot-water apparatus to which it is attached; yet this is what frequently happens, for if the supply of hot water is a failure "surely it must be the boiler's fault." If the water drawn is not hot, or, if hot, then in insufficient quantity to be useful, few householders can attribute it to anything but the boiler, although the boiler may even be known to have a good reputation.

It cannot be too widely understood and accepted as correct in the most practical sense, both by those who handle gas boilers and those who use them, firstly, that the day of experimental and doubtfully efficient gas-heated boilers is past. The boiler is no longer a new thing, and the inefficient and even the fairly efficient kinds have been weeded out and disappeared some years ago. Under reasonable and proper conditions gas-heated boilers of

present designs show an efficiency—that is to say, a transference of heat from the burning fuel to the water—far higher than any other boiler and as near to transferring all the heat as is known to be practicably possible. Actual efficiencies, if stated, lead to controversy, so we must be satisfied with saying, as is undeniably correct, that modern well-known makes are as hard up against the highest limit of heat transference as is ever likely to be attained or is scientifically possible. Secondly, that the hot-water apparatus existing in people's houses (and by this we mean the rest of the hot-water system other than the boiler itself) is, in the majority and not the minority of cases, faulty in one or more important details, a single fault being often sufficient to account for marked failure in the yield of hot water at the taps. The apparatus may not, probably cannot, prevent the water being heated by the boiler, but heating the water and drawing it from the taps are two quite different things; and this it is that the average householder does not know and finds it difficult to understand.

Taking the two foregoing points in relation to each other, it will be seen that the gas boiler can well make good progress and become, as is intended, the companion of the gas cooker; but the commonly faulty hot-water apparatus can frequently cause the boiler to be blamed as inefficient and extravagant—a fact which must interfere with progress to some extent.

There now comes the question as to how this difficulty is to be overcome. The user has a boiler installed to supply hot water, as much as the household requires and at a sufficient temperature. It may be the deficiencies of this supply, due to the existence of an inefficient coal range boiler, that bring the customer to the gas company's or other tradesman's sales-room. If the order is for a boiler to be supplied and connected to existing hot-water apparatus, as nine-tenths of the orders are, and this is just literally executed, then there is considerable prospect of complaint following.

Let us assume that a boiler of sufficient effectiveness or even over-effectiveness has been supplied and the fixing is done in the best manner; even so some detail of the apparatus can easily throw the whole thing out. As already stated, the boiler is probably blamed, but, whether blamed or not, the boiler—or, as we should rather say, the result at the tap—proves of no use to the housekeeper, and if no other steps were taken would doubtless have to come out. No one wishes to pay for and keep an appliance that does not perform the duty expected of it.

No, it is not sufficient merely to sell and fix boilers now that it is recognised that half the hot-water apparatus in existence is a failure, more or less while another fourth cannot be called better than a limited success. The man who attaches a new boiler to an existing hot-water apparatus must recognise that he takes on his shoulders the whole responsibility of that apparatus. Whatever faults it possesses must be counted as his faults, for he has got to make them good or else have his boiler condemned. It is unfair, of course, but the situation has to be faced.

What is now being done by so many gas companies or gas departments is to have a certain number of their men sufficiently trained in hot-water work so that an application for a gas boiler can be followed by a proper inspection of the whole hot-water system, with a view to specifying all alterations which appear to be necessary to afford the boiler a chance of showing its best efficiency. The cost of these alterations appears in the estimated cost of installing the boiler, and the consumer is told, if necessary, what is going to be done.

It has become obviously requisite that those who handle gas boilers should have a practical knowledge of hot-water work. Were it not that so many faulty hot-water piping installations exist, then the fixing of a boiler would only amount to connecting up by some recognised simple method, but, as stated, the mere connecting of the boiler will not, except in very few cases, ensure successful results.

Practical hot-water work cannot enter into this article, but it may be said that the common faults in existing hot-water systems are few in number (but can be very frequently found) and their effects are broadly these:—Water is heated in the boiler and gathers in the hot-water storage tank, but it cannot all be drawn. Sometimes a good proportion can be had at the taps, sometimes little. In a recent instance opportunity was had of testing this with some precision. A forty-gallon tank was full of high-temperature water from top to bottom, and on drawing hot water at the bath tap about twenty gallons issued hot, followed by five gallons at a reduced temperature, cool water succeeding this. On applying the hand to the tank it was found that the upper third was unbearably hot, which showed that there were about fifteen gallons not available at the bath and, as it happened, not available at any tap. Forty gallons of well-heated water yielded twenty-five gallons as a regular thing. This would not be considered a very bad case, as there occur many much worse. It may be added that this happens usually when the hot-water tank is upstairs, the taps drawing water from the circulating (flow) pipe. Another faulty result is the drawing of mixed hot and cold water at the tap; it is a common thing (as many readers must know) to have a rather small quantity at high temperature first issue from a tap, whereupon temperature suddenly drops, so that the yield is cooler, though the quantity may be liberal. It is easy for cold water to mix with the hot if the pipe connections are not correct. A further common fault is that high-temperature water cannot be had until the whole, or nearly the whole, of the water in the apparatus is fully hot, so that, although a small quantity of really hot water may be wanted, and this quickly, it cannot be had until a much greater quantity has been heated. There are other results equally disappointing, but bearing some relationship to those just described, and it is these that weigh on the shoulders of the man who fixes the gas boiler.

## NOTES.

The name of Messrs. Benham & Sons, Ltd., 66, Wigmore-street, W., has been for long associated with the latest developments in cooking appliances, while the workmanship of their fittings is especially good. We give an illustration of a large kitchen entirely fitted with a complete cooking installation. The use of these fittings in mess-rooms and kitchens results in great economy of space, increased efficiency, and greater cleanliness. The firm's recent contracts include those made with Messrs. Vickers, Ltd., Messrs. W. Cubitt & Co., a cotton powder company and explosives loading company, and the Royal Naval Cordite Factory.

Our attention has been called to a useful gas-fired apparatus for the rapid, economical, and hygienic disposal of house and garden refuse, wet or dry—*i.e.*, the Davis Domestic "Burn-All," supplied by the Davis Gas Stove Co., Ltd., 60, Oxford-street, London. The body of the apparatus consists of a steel-plate outer casing, with a removable inner lining of the same] material. The fittings include:—

(1) An interior perforated combustion plate, on which rests the garbage to be burned;

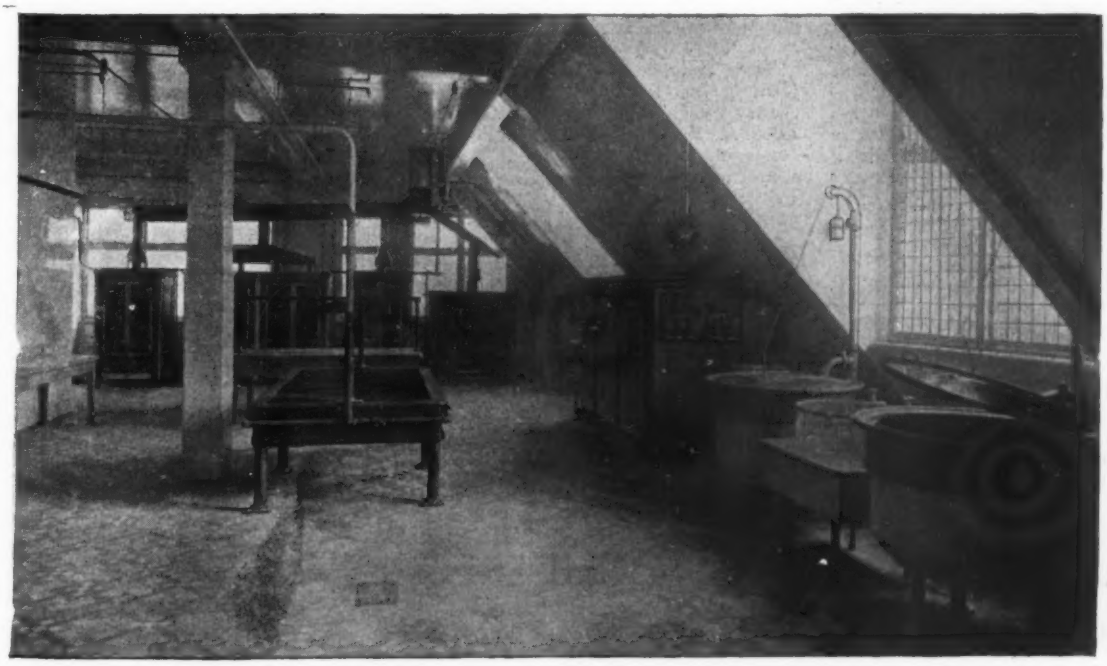
(2) A powerful atmospheric ring burner with the jets disposed to give judiciously varied flame lengths;

(3) A gas injector and air regulator, with provision for either right or left hand connection, by means of the usual gas barrel or flexible tubing;

(4) A hinged door for inspection and raking; and

(5) A poker for raking and loosening the garbage occasionally whilst burning.

The base accommodates a projecting and removable tray, into which falls the ash of the garbage consumed, and around it are provided the necessary air-ports for supporting combustion and ventilating the apparatus. The top cover—made as a removable lid, affording ready

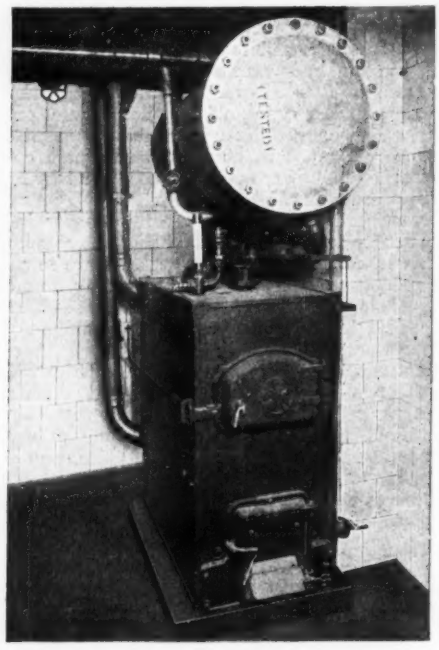


**A Kitchen fitted by Messrs. Benham & Sons, Ltd.**

access to the interior—carries the feeding aperture, with its separate and close-fitting cover, and the flue outlet, to which may be attached any necessary length of flue pipe. The apparatus has been designed to permit of it being placed on the top of any ordinary kitchen range, the flue outlet projection fitting conveniently between the bars of the range plate-rack, though the latter may, if preferred, be removed altogether, or the apparatus can be placed in the scullery in any convenient position that will permit of the necessary flue-pipe being carried into the copper fire chimney. It can also be placed in the angle formed by the kitchen range chimney-breast, the flue-pipe connected to it being carried into the chimney. In fixing, connection is made to the gas by one or other of the alternative inlets fitted to the apparatus, stopping the unused inlet by means of the cap provided for the purpose. For permanent fixing, the gas connection is best made by means of ordinary gas barrel and the work done by a competent gasfitter. For casual use, however, the apparatus can be safely and quite satisfactorily connected by means of flexible tubing. The burner is lighted up five minutes or so before use and the refuse to be burnt emptied into the combustion chamber to any extent not exceeding two-thirds of its capacity. An occasional raking and stirring or loosening with the poker by way of the small inspection door serves to prevent clogging and accelerate burning, the only other attention required being the feeding of the chamber until all the refuse is consumed, and finally the emptying of the ashes. The Davis Domestic "Burn-All" will reduce to ashes in the shortest possible time anything and everything that can be so dealt with by the application of heat. A pailful of mixed kitchen garbage can be reduced to less ash than will fill the small tray provided, the burning taking less than one hour and costing (with gas at 3s. per 1,000 cubic ft.) not more than 1d.

---

A large amount of special emergency and other work has been carried out by the firm of Haywards, Ltd. (who became a "controlled establishment" during the early part of the war). They have supplied upwards of half a million feet super. of their patent "Reform" system of roof glazing for factories and extensions employed in munitions and other Government supplies work, as well as over aerodromes and other buildings of various classes. The "Reform" system of roof glazing is one of the simplest systems on the market, possessing the advantages of invulnerability, easy handling, and repair, allowing the use of blinds or scaffolds over same without damage to the glass or lead work. The company carried out several contracts for large numbers of steel sashes for hospital and other buildings, these being made of the War Office standard patterns, and constructed of Haywards' patent puttygrooved section bars, giving lightness and strength, combined with secure glazing. The main necessities of usual buildings for manufacturing purposes which have been so much utilised during the war for the manufacture of munitions and various war supplies resolve themselves into the provision of a suitable weathertight and light-giving roof and windows in the walls, whether the construction is mainly of concrete or corrugated-iron, etc.; and when the shell is thus provided two other important points that arise are suitable heating of the building and the provision of staircases, both for general service and escape in case of fire. Haywards' fire-escape staircases are well known, and in certain cases they have passed through severe tests with most satisfactory results. At the Corporation Silk Mills at Derby the building was completely gutted by a disastrous fire, and not only did the iron staircase remain intact in spite of the heat and flames, thus securing the escape in safety of all the workers before the fire reached its bad stages, but the strength of the staircase was such that it remained up, even when the walls and floors fell; in fact it actually appears to have held up the walls next to it to some considerable extent, its top part remaining up without other support. On the mill being rebuilt the same staircase was used again without alteration. Another large building on the north-west coast was burnt out and the staircases similarly remained practically intact. In regard to heating, many interesting examples have been employed, and the types embrace all the various systems in general use—steam, hot water, etc. These may be carried out in large munition buildings by separate steam boilers of Lancashire or other type or from waste steam; or for moderate size buildings the low-pressure hot-water circulating system is simple, efficient, and reliable when well schemed and used with proper skill. In some cases, besides heating, a convenient and suitable hot-water service is a necessity, and can often be advantageously carried out together. The illustration herewith shows a convenient application of this, worked from one furnace, partially automatically controlled, thus requiring the minimum of attention for stoking, etc. In the illustration



**Hot-Water Service (Haywards, Ltd.).**

the lower part shows a square efficiently lagged boiler of good type, from which heating mains can be seen coming away at the back and going direct to a system of piping and radiators—in the particular case, being a large bank premises, with radiators in all rooms and corridors, as well as overhead, around skylights and domes, to prevent cold down draughts; whilst above the boiler is an efficient calorifier for the hot-water service about the premises, this being quite separate from the boiler water heating same, and therefore doing away with many usual troubles of furring in pipes, boiler, etc.

---

The Holophane System of Illumination (Holophane, Ltd., 12, Carteret-street, Queen Anne's-gate, S.W.) has now been extensively adopted both here and abroad, and among those who have adopted it are the chief Government Departments, munition factories, shipping and industrial companies, and railways. The reflectors are made in three types—the Extensive for use in premises with comparatively low ceilings, where they should be placed at intervals of twice their height above the working plane; the Intensive type, suitable for premises with average ceilings, and which should be placed at intervals which equal one and a half times their height above the working plane; and the Focusing type, for premises with high ceilings. These should be placed at intervals equal to their height above the working plane. The excellence of the patent is well shown in the lighting of the Tube stations and of many railway carriages.

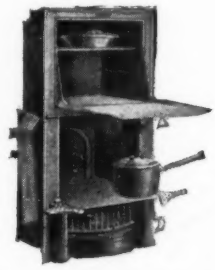
---

The Interoven Stove Company, Ltd. (156, Charing Cross-road, W.C.), have attained a deservedly high reputation for their stove, which is equally well adapted for cooking, hot-water heating and ordinary washing purposes. Its special advantages are that the oven flues are cleanable without removing the oven, the stove is made in two parts, rendering setting and plumbers' work very easy, and the boiler is quickly

**The 1916 Improved "Interoven."**

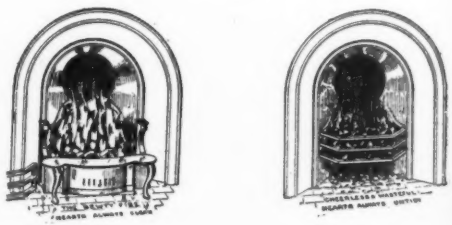
Mantel designed by Mr. G. McLean Ford, F.R.I.B.A.

disconnected. There is a ventilator in the oven, and the wearing parts are heavy and strong. An improved variant of the stove



**The "Interoven" Stove arranged for Cooking.**

has been put on the market under the title of "The 1916 Improved Interoven," the mantel of which has been made from the design of Mr. G. McLean Ford, F.R.I.B.A. The "Bewty" Fire has been specially designed



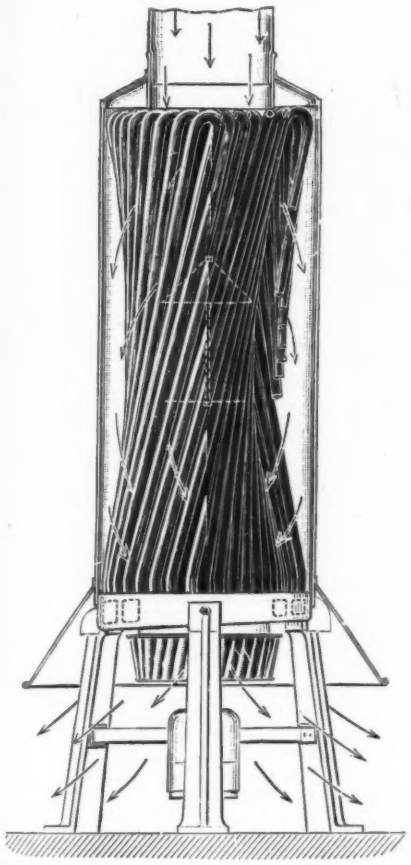
**The "Bewty" Fire.**

by the inventor of the Interoven Stove to effect a similar economy in the sitting-room to that effected by the Interoven Stove in the kitchen. It is adaptable to all kinds of ugly firegrates, converting them into economical

stoves with clean hearths, and tenants can invest in the fire because it can be taken away with them, while it can be used by property owners who wish to modernise their houses. If an old bottom grate is badly burnt it can be broken or knocked out, as the "Bewty" Fire hides and covers it.

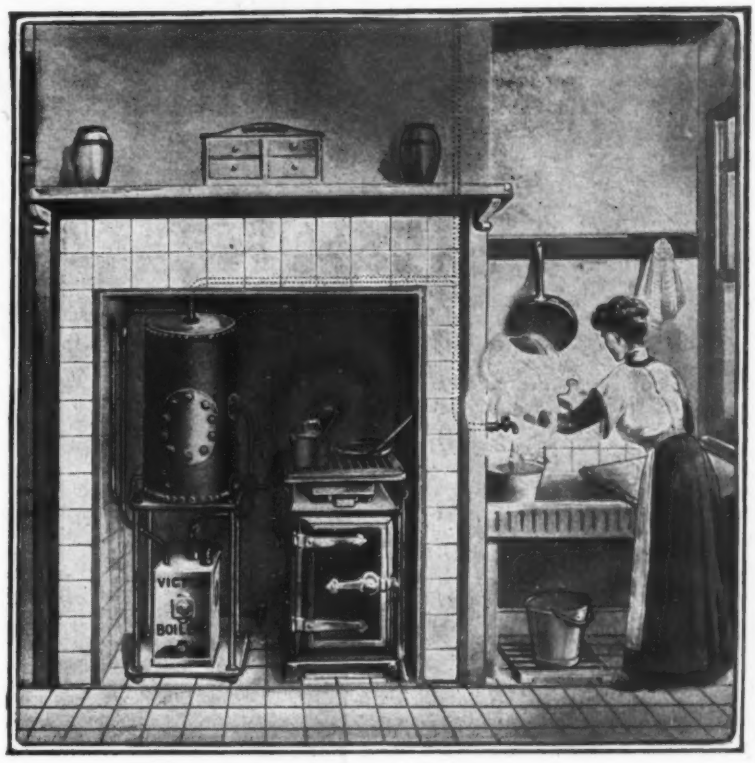
---

Messrs. James Keith & Blackman Company, Ltd., of 27, Farringdon-avenue, E.C., are well known for the excellence of their work and their numerous admirable patent appliances in connection with heating and ventilation. Their



**"Inclined Tube" Thermo Ventilator.**

"Inclined Tube" Thermo Ventilator provides a system of small independent units which are capable of heating and ventilating a particular section of a building. The Thermo Ventilator warms a large volume of air rapidly and distributes air without draught and with the least possible driving-power. It is composed of a number of specially-arranged steam tubes with an annular base casting, below which is fitted a Keith open-type centrifugal fan, and round the tubes is a steel casing the lower part of which is formed into an air deflector. The air passes across the tubes as indicated by arrows, much higher efficiency being thus gained than is possible with the air blowing endways along the tubes, thus heating a large volume of air with low power consumption, and each tube can be expanded separately into the base casting without disturbing the other tubes. They have also patented the "Keith Light," a system of high-pressure gas, by which the same result can be obtained with half the amount of gas, thus effecting a great economy. These have been used with excellent result in many factories, and also in a portion of Regent-street (City of Westminster lighting), as well as Lewisham High-road and Rochester Bridge. The firm are among the best and foremost of heating and ventilating engineers.



**Gas Equipment for Kitchen.**
By Mr. Thomas Potterton.

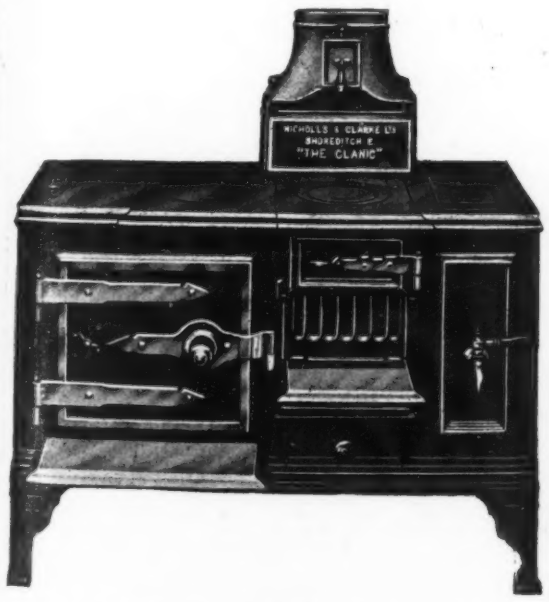
Messrs. Nicholls & Clarke, Ltd., of Shoreditch, have supplied several specialities for the Army and Admiralty. Their "Clanic" Portable Cooking Range, which we illustrate, with single and double ovens, has been provided at many Y.M.C.A. huts, as well as for the Army and Admiralty. These ranges are well adapted to the requirements of camp-life, and have given satisfaction all round. The "Clanic" Round Slow-Combustion Stove is made in nine sizes, and has been supplied to the general military hospitals, the Y.M.C.A., and other huts. The firm have also provided an excellent boiler for camps—*i.e.*, the "Clanic" Camp Boiler. It is made in several sizes for use in munition factories as well as military camps and huts.

---

Messrs. Musgrave & Co., Ltd., St. Anne's Ironworks, Belfast, and Sardinia House, Kingsway, manufacture an admirable slow-combustion stove and air-warmer which has been extensively adopted for use in munition and other factories. It maintains a uniform and comfortable working temperature which tends to protect machines and finished articles from rust and deterioration, and it is very economical in fuel consumption, while it can be fixed in a few hours, and is specially suitable for extensions. The flues can be arranged either underground or overhead.

---

Among manufacturers whose ingenuity has given a new life to gas heating may be mentioned Mr. Thomas Potterton, of Cavendish Works, Ravenswood-road, Balham. Gas heating, whether for purposes of cooking, the supply of hot water for cooking and baths, or for the ordinary heating of rooms will be more and more generally adopted, since it is clean and economical and convenient, saving unnecessary labour. While coal requires careful management if the best results are to be obtained from it, good gas appliances secure such results automatically. Mr. Potterton's "Victor" Boilers, which can be used independently or in conjunction with an ordinary hot-water supply, are too well known to need description; while his "Victor" complete hot-water supply apparatus is especially suitable for complete new hot-water installations, and all the work of the firm can be confidently recommended. The illustration shows the equipment of the up-to-date residence or flat where the whole duty is performed by gas appliances.




**"Clanic" Portable Range (Messrs. Nicholls & Clarke).**

**"Clanic" Camp Boiler (Messrs. Nicholls & Clarke).**

# THE BUILDING TRADE.

## THE PLUMBERS' COMPANY.

At the Election Court of the Worshipful Company of Plumbers at Guildhall the Master, Mr. W. D. Caröe, M.A., F.R.I.B.A., the Warden, Alderman Sir John Knill, Bart., and the Rt. Hon. Alderman Sir Vezey Strong, K.C.V.O., were, upon the motion of the Chamberlain, Mr. Adrian Pollock, seconded by Mr. Chas. Hudson, the oldest Freeman of the Company, unanimously re-elected to their respective offices for the ensuing year. The Master reported upon the war-work done by the Company for H.M. Government in the training of plumbers in special branches of work required in the making of plant used in the manufacture of explosives. He said the urgent needs of the military and naval services could not have been maintained as they had been but for the patriotic and devoted manner in which the Canning Town Lodge of Lead Burners and Chemical Plumbers of the United Operative Plumbers' Association of Great Britain and Ireland particularly and the Association generally had co-operated with the Company and the London Council of Registered Plumbers in carrying out the work, which is of the most arduous and responsible nature. In recognition of the great services rendered by these two bodies two members of the United Operative Plumbers' Association, nominated by the Canning Town Lodge to advise on and conduct instruction and tests in special branches of workmanship, Mr. McNicol and Mr. Hegarty, were presented to the Court and thanked by the Master. The Freedom of the Company was conferred on Mr. W. H. M. Smeaton, superintendent of the classes of instruction given by the Company in their training workshops at King's College, upon his appointment by the Government of India to the post of chief of the Plumbers' Department in the Royal Cordite Factory, Madras, "in consideration of his distinguished services in the cause of plumbers' craftsmanship and of war-work connected therewith."

## AN ADJUSTABLE HOPPER SASH VENTILATOR.

Mr. G. C. Vernon-Inkpen, architect, of Portsmouth, has patented (Royal Letters Patent No. 9,383) an arrangement of Hopper ventilator which is entitled the "Vernon Patent Adjustable Hopper Sash Ventilator," and is adapted for use in windows of schools, hospitals, public institutions, factories, etc. The essential features are:—Ventilation without draught; effective under all conditions of weather, either wind, rain, or varying temperatures; the sashes are weather checked and the sills form a collecting-tray for water; ease of adjustment and removal—the centre sash is suspended between the side checks; unobstructed access to the principal window or opening in time of fire, panic, or for cleaning purposes; no fastenings, fittings, or loose parts; easily fixed to existing windows.

We give illustrations of the patent, which has been adopted in some large schools in Portsmouth. The Hopper sash has no mechanical parts, is extremely simple, and has been proved by experience to be absolutely watertight. As it is not hinged it can be lifted out, while the manner in which the sash is adjusted at base forms an effectual bar to the admission of water. We have seen a model of the invention, which should be useful in hospitals and other similar buildings.

The Vernon Patent Adjustable Hopper Sash Ventilator.

The Vernon Patent Adjustable Hopper Sash Ventilator.

## GENERAL BUILDING NEWS.

THEATRE, LONDON, W.

The new theatre in West-street, Shaftesbury-avenue—the St. Martin's—is nearing completion. The architect is Mr. W. G. Sprague. There will be accommodation for about 700 people.

### TRADE NEWS.

Boyle's latest patent "air-pump" ventilators, supplied by Messrs. Robert Boyle & Son, ventilating engineers, 64, Holborn-viaduct, E.C., have been adopted for new factory works, Greenford.

The Government canteen buildings are being supplied with Shorland's warm-air ventilating patent Manchester stoves by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

An important matter in the erection of buildings at the present time is to avoid using unnecessary steelwork—in fact the Ministry of Munitions in most cases insist on this, even for urgent war buildings. Another point is to avoid importing materials that can be dispensed with, and a further point is quick erection with the minimum amount of labour. From these points of view our attention has been called to the Siegwart floors (the Siegwart Fireproof Floor Company, Ltd.), which, owing to the large spans and the light weight of the floor, require the minimum amount of constructional steelwork and are erected without centering. Moreover, it is not necessary to import foreign timber in the erection of the floors, which are very speedy in erection, whilst they only require the minimum amount of labour.

## PROPOSED NEW BUILDINGS AND OTHER WORKS.*

In these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works, at the time of publication, have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; L.G.B. for Local Government Board; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

Aberdeen.—The Plans Committee of the T.C. has passed five sets of plans representing a value of about £750.

Argentina.—The "Comisión Asesora de Asilos y Hospitales Regionales (Belgrano 909, Buenos Aires) for the installation of electric power plant and material necessary for the electric lighting of a hospital at Bell Ville, Province of Córdoba. Estimated cost, 115,204 pesos currency (about £10,000). Sanitation and water supply works at the National Tuberculosis Sanatorium at Santa Maria, Province of Córdoba. Estimated cost, 147,679 pesos currency (about £12,900).

Barnsley.—Plans approved by the County B.C.:—Dr. Kates, motor garage and washhouse to house, Pogmoor-road; Messrs. Wilson & Longbottom, alterations to premises, Nelson-street; Mr. Tom Gaimster, garage and shed, Race-street; Messrs. C. Marsden & Sons, Ltd., new brick chimney to works, Old Mill-lane.

Bath.—At a recent meeting of the Corporate Property Committee plans for the extension of the Electric Theatre, Westgate-street, were recommended for approval.

Birmingham.—The Birmingham City Council has received the L.G.B.'s authority to prepare an amending scheme in relation to a portion of the scheme of town planning for East Birmingham. The object the Council desired to achieve was that certain proposed new roads should be made to fit in with roads proposed to be made in the adjoining town-planned area of North Yardley.

Blackpool.—The Corporation has decided to promote a Bill in Parliament for the purpose of carrying out various improvements in the town, including the construction of two open-air bathing pools, the extension of the promenade, etc.

Brighouse.—Plans approved by the U.D.C.:—Ferro-concrete coal store at Mill-lane, for the Gas Committee; hoist at Prince of Wales' Mills, for Messrs. Ormerod Bros., Ltd.

Buckie.—The T.C. has had before it the schedule issued by the Secretary for Scotland asking particulars of public works proposed to be executed by the T.C. after the war. The Committee provisionally resolved to enter the following works in the schedule:—(1) Completion of original scheme of harbour extension; (2) provision of workmen's houses; (3) paving of Low-street and Commercial-road. The Town Clerk has been instructed to write to the engineers and ask them to prepare a short statement of the works and money necessary to complete the original scheme of harbour extension. The T.C. has had before it a plan of alterations at the Cholera Hospital, with relative report, when it was resolved that the repairs and alterations noted in the report should be executed.

Buxton.—The U.D.C. has passed a plan of motor shed in Hartington-road, for Dr. Burt.

Chepstow.—The U.C. has passed plans of blocks of houses in Hardwick-lane.

Chester-le-Street.—The R.D.C. is considering schemes of housing, road-making, and the provision of sewers after the war.

Colombia (Republic of).—Municipal Council of Zaragoza, Department of Antioquia, to raise a loan of 15,000 pesos gold (£3,000) for the installation of an electric power plant and the construction of an aqueduct. Municipal Council of Mosquera, Department of Cundinamarca (1) to raise a loan of 10,000 pesos (£2,000) for an electric power installation and aqueduct works, and (2) the Municipal Council of Concepción, Department of Antioquia, to contract a loan of 5,000 pesos (£1,000) for an electric power plant.

Derry.—House building scheme for a recently formed syndicate.

Dundee.—The Poorhouse Committee of Dundee P.C. has received the L.G.B.'s approval to the accommodation at Ashcliffe House for seventy children.

Dunfermline.—A model cottage on the new system designed by Mr. Walter Wilson. Plans remitted to the Town Planning Committee.

Dundee.—Housing scheme to cost £30,000 or £40,000.

Fife.—The Town Planning Committee of Dunfermline T.C. has given authority to Mr.

* See also our list of Competitions, Contracts, etc., on page 202

Walter Wilson, Inspector of Works, Dunfermline, to erect an experimental cottage according to a method patented by him.

Heston and Isleworth.—Plans before the U.D.C.:—From Mr. J. Elmes, for water-closet and offices at Douglas-road, Hounslow; from Messrs. Early & Sons, for boiler-house, mess-room, offices, and lavatories at Strafford House; from Mr. J. Wills, for dwelling-house at Vicarage Farm-road.

London.—The Licensing Justices have sanctioned certain alterations to be made in the off-licensed premises, 282, Battersea Park-road, Battersea; licensee, Mrs. Mary Jane White.

Ossett.—The T.C. has approved plans for dye-house, scouring shed, and warehouse, for Messrs. W. Walker & Sons, Highfield Mills; motor garage, West Wells-road, for Mr. W. Hutchinson; and warehouse (wood) at Highfield Mills, for Messrs. W. Walker & Sons.

Port Glasgow.—Raising embankment at Auchendores Reservoir, in the parish of Kilmacolm, to abstract water from Cunston Burn and Bogside Burn and convey it into Auchendores Reservoir, constructing additional filters at Parkhill, etc., for the T.C. The proposed scheme is estimated to cost £20,000.

Portugal.—Construction of school buildings in the town of Valença do Minho, at an estimated cost of 14,310 escudos (about £2,100 at current rate of exchange).

Richmond (Surrey).—Plans passed by the Corporation:—Messrs. Reynolds & Co., conveniences at Peerless Rubber Company's works, Princes-street; Messrs. Yetts, Sturdy, & Usher, conveniences at Fox and Duck public-house, Petersham; Messrs. Boroughs & Dixon, conveniences at Brewery-buildings, Petersham-road.

St. Asaph (Denbigh).—The R.D.C. has decided to intimate to the L.G.B. that among the things which the Council hoped to deal with after the war were the Llandulas housing and water questions, the question of the road between Llanfairtalhaiarn and Llansannan, and other desirable road improvements.

Shoebury.—With reference to the L.G.B.'s inquiry about public works which may be proceeded with after the war, the U.D.C. has prepared a statement of their requirements. Twelve working-class dwellings are urgently needed, for which the land would cost £470 and the buildings £3,100; private street works would involve an outlay of £800; and £1,000 was required for making-up Church-road. The Council is not prepared to give an estimate of the proposed sewerage works; this will be ready in the course of a week or two.

Southend.—Plans passed by the T.C.:—Alterations and additions, "Mapenzi," Hamstel-road, Capt. A. Agnew; conversion of house into two flats, 98, Valkyrie-road, Mr. H. J. Teakle; house, Underwood-square, Mr. G. Bacon; alterations and additions, "Marine Lodge," Marine-parade, Leigh, Mr. J. Mallinson; conversion of house into flats, 22, Palmeira-avenue, Messrs. Edmondson, Ltd.; drainage to six houses, Armitage-road, Mr. F. S. Dunnett; Nos. 5, 6, and 7 on block plan, dwelling-houses, Gainsborough-drive, Mr. H. Pitt; two bungalows, Oakleigh Park-drive, Mr. S. Wiltshire.

Stalybridge.—The D.C. has passed plans for a motor garage in connection with a house in Mottram-road belonging to Mr. Roger Robinson, and for an extension of warehouse in Tame-street belonging to Henry Simon (Stalybridge), Ltd.

Swanage.—At a recent meeting of the U.D.C. a letter was received from the Board of Trade enclosing three plans of a branch railway and proposed wharf to be erected in the harbour. The U.D.C. has approved a plan (deposited by Mr. Pond) for a bungalow at Newton.

Uruguay.—Tenders will be received at the "Dirección General de la Asistencia Pública Nacional," Calle Rincón 416, Montevideo, on October 3, for the installation of a heating system by means of hot-water pipes in the Pereira-Rossell Hospital at that city.

West Ham.—Plans approved by the T.C.:—Lavatory accommodation at 53 and 54, Victoria Dock-road, Canning Town, for Messrs. Reid, Taylor, & Co.; alterations, Connaught Tavern public-house, Royal Albert Docks, for Mr. Bruce J. Capell; addition, 6 and 8, Ward-road, Stratford, for Mr. T. Watson; cooling-room, Excel Company's premises, Carpenter's-road, Stratford, for Mr. W. Knight; new stabling, Messrs. Bedwell & Co.'s premises, 440, Barking-road, Plaistow, for Mr. C. Living, jun.; addition to works, Crispin's Wharf, High-street, Stratford, for Messrs. J. Hamilton & Son; workshop, Given-Wilson Institute, Plaistow, for Miss Bolton; alterations, Alexandra Mills, High-street, Stratford, for Messrs. Moore, Smith, & Durrant; alterations, 338 and 340, High-street, Stratford, for Messrs. Goodwyn & Sons; rebuilding and extension of premises, 321, Romford-road, Forest Gate, for Mr. W. Beattie; addition, 72, High-street, Stratford, for Mr. R. Banks Martin; addition to factory, Broad-street and Culham-street, for Mr. G. J. Hoskins; addition to factory, Messrs. G. Rice & Sons' premises, Waston-road, Stratford, for Mr. A. E. Symes; addition to buildings, Plaistow Wharf, for Messrs. A. Lyle & Sons; washhouses, British Alizarine Company's premises, Silvertown, for Mr. F. Hamlett.

Wombwell.—The Highways and Buildings Committee has recommended for approval a plan for a dwelling-house for Mr. A. Poole, in Wath-road.

### DECEASED BUILDER'S ESTATE.

Mr. William Fenn, of 32, Cowper-street, Leeds, joiner and builder, has left estate of the value of £11,904.

## RATES OF WAGES IN THE BUILDING TRADE.

THE following are the present rates of wages in the Building Trade in the principal towns of England and Wales. It must be understood that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that may occur:—

| — | Masons. | Bricklayers. | Carpenters, Joiners. | Plasterers. | Slaters. | Plumbers. | Painters. | Masons' Labourers. | Bricklayers' Labourers. | Plasterers' Labourers. |
|---|---|---|---|---|---|---|---|---|---|---|
| | d. | d. | d. | d. | d. | d. | d. | d. | d. | d. |
| Aberdare | 9½ | 9½ | 9½ | 9½ | 9½ | 9 | 8 | 6½ | 6½ | 6½ |
| Accrington | 10 | 10 | 10 | 9½ | 9 | 9 | 9½ | 6½ | 6½ | 6½ |
| Altrincham | 9½ | 10½ | 11 | 10 | 8½ | 10 | 10 | 7½ | 7½ | 7½ |
| Ashton-under-Lyne | 11 | 11 | 10½ | 10½ | 9½ | 11 | 10 | 7 | 7½ | 8 |
| Barnsley | 10 | 10 | 9½ | 9½ | 9 | 9½ | 8½ | 7½ | 7½ | 7½ |
| Barrow-in-Furness | 10½ | 11 | 10½ | 10½ | 10½ | 10½ | 10½ | 8 | 8 | 8 |
| Barry | 9½ | 9½ | 9½ | 10 | — | 9 | 8½ | 6½ | 6½ | 6½ |
| Bath | 9 | 9 | 9 | 8½ | 7½ | 9 | 8 | 6½ | 6½ | 6½ |
| Bedford | 8 | 8 | 9 | 8½ | 8 | 9 | 6½ | 5½ | 5½ | 6 |
| Birkenhead | 1/- | 1/- | 1/- | 1/- | 1/- | 1/- | 11 | 8 | 8 | 8 |
| Birmingham | 11½ | 11½ | 11½ | 11½ | 10½ | 11½ | 10½ | 8½ | 8½ | 8½ |
| Bishop Auckland | 9 | 9 | 9 | 9½ | 11 | 9 | 8 | 6½ | 6½ | 7½ |
| Blackburn | 10 | 10½ | 10 | 10 | 9½ | 10 | 9½ | 7 | 7½ | 7½ |
| Blackpool | 11 | 9½ | 9½ | 9½ | 8½ | 9½ | 9½ | 6 | 6 | 6 |
| Bolton | 10½ | 11 | 10½ | 10½ | 10 | 10† | 9½ | 6–7 | 7 | 7½ |
| Bournemouth | 8½ | 9 | 9 | 9 | 8½ | 9 | 8½ | 6½ | 6½ | 6½ |
| Bradford | 10½ | 10½ | 10 | 10 | 10 | 10 | 9½ | 8 | 8 | 8 |
| Bridgwater | 6½ | 6½ | 6½ | 6½ | 6½ | 6½ | 6 | 4 | 4 | 4 |
| Brighton | 9 | 9 | 9 | 9 | — | 9 | 7½ | 6½ | 6½ | 6½ |
| Bristol | 11 | 11 | 10½ | 11 | — | 11 | 10 | 8 | 8 | 8 |
| Burnley | 10 | 10½ | 9½ | 9½ | 8½ | 9½ | 9½ | 7 | 7½ | 7½ |
| Burton-on-Trent | 9½ | 9½ | 9½ | 10 | 9 | 9½ | 8½ | 7 | 7 | 7 |
| Bury | 11 | 11 | 10½ | 9½ | 10 | 10½ | 10 | 7 | 7½ | 7½ |
| Cambridge | 9½ | 9 | 9 | 9½ | 9½ | 9½ | 7½ | 6 | 6 | 6 |
| Canterbury | 8½ | 8 | 8 | 10 | — | 8½–9 | 7 | 5 | 5 | 5 |
| Cardiff | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 9½ | 7½ | 7½ | 7½ |
| Chatham | 8‡ | 10 | 10 | 9‡ | 9‡ | 10 | 8½ | 7 | 7 | 7 |
| Chelmsford | 8 | 7½ | 8½ | 9 | — | 7½ | 6½ | 5 | 5 | 6½ |
| Cheltenham | 9½ | 9½ | 9½ | 9½ | — | 9½ | 9½ | 6½* | 6½* | 6½* |
| Chester | 9½ | 10½ | 10 | 9½ | 9½ | 10½ | 9½ | 6½ | 7 | 7 |
| Chesterfield | 9 | 9½ | 9 | 8 | 9 | 8½ | 8½ | 5½ | 5½ | 5½ |
| Colchester | 8 | 8½ | 8½ | 9 | 8 | 9 | 6 | 5½ | 5½ | 5½ |
| Coventry | 10½ | 11 | 11 | 10½ | 11 | 11 | 10 | 8½ | 8½ | 9 |
| Crewe | 7½ | 8 | 7½ | 9 | 8½ | 8½ | 8 | 5½ | 5½ | 6 |
| Darlington | 9½ | 10 | 10 | 10½ | 10 | 9½ | 9 | 7 | 7 | 7 |
| Derby | 9½ | 10 | 9½ | 9 | 9 | 9½ | 8 | 7 | 7 | 7½ |
| Doncaster | 9½ | 9½ | 9½ | 9½ | 9½ | 9 | 8 | 6½ | 6½ | 7½ |
| Dudley | 8½ | 10 | 10 | 8½ | 8½ | 8 | 7½ | 6½ | 6½ | 6½ |
| Durham | 9½ | 9½ | 9½ | 9½ | 10 | 9 | 8½ | 6½ | 6½ | 7 |
| East Glam. and Mon. Valleys | 10 | 10 | 10 | 10 | — | — | 9 | 7 | 7 | 7 |
| Exeter | 8 | 8½ | 8½ | 8½ | 7½ | 7½ | 7½ | 5½ | 5½ | 5½ |
| Folkestone | 8½ | 9 | 9 | 9½ | 8½ | 9 | 8 | 7 | 7 | 7 |
| Gloucester | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 7 | 7 | 7 |
| Grantham | 8 | 8 | 7½ | 7½–8 | 7½–8 | 7 | 6½ | 5 | 5 | 5 |
| Grays | — | 10 | 10 | — | — | 9½ | 8½ | 7 | 7 | 7 |
| Grimsby | 9 | 9 | 9½ | 9½ | 9 | 9 | 8½ | 7 | 7 | 8 |
| Great Yarmouth | 8 | 8 | 8 | — | 8 | 8 | 6½ | 5 | 5 | — |
| Halifax | 10 | 10 | 9½ | 9 | 9 | 9 | 9½ | 7 | 7 | 7 |
| Harrogate | 9½ | 9½ | 9½ | 9 | 8 | 10 | 8½ | 6½ | 6½ | 6½ |
| Hartlepools | 10 | 10½ | 10½ | 10½ | 11 | 10½ | 9 | 7½ | 7½ | 8 |
| Hastings | 8½ | 8 | 8 | 8½ | 8 | 8 | 7 | 6½ | 5½ | 6½ |
| Hereford | 8 | 8 | 7½ | 8½ | 8 | 7 | 7 | 5½ | 5½ | 5½ |
| Huddersfield | 11 | 11 | 10½ | 9½ | 10 | 9 | 8½ | 7½ | 7½ | 7½ |
| Hull | 10½ | 10½ | 10½ | 10½ | 10½ | 10 | 9 | 8½ | 8½ | 8½ |
| Ipswich | 8½ | 8½ | 8½ | 9 | 9 | 8½ | 7 | 5½ | 5½ | 5½ |
| Lancaster | 10½ | 10 | 10 | 10 | 9 | 10 | 9 | 6 | 6½ | 7½ |
| Leamington Spa | 9 | 9 | 9 | 8½ | 9 | 9 | 8 | 6½ | 6½ | 6½ |
| Leeds | 10½ | 10½ | 10½ | 10½ | 10½ | 11 | 9 | 8 | 8 | 8½ |
| Leicester | 10½ | 10½ | 10½ | 10½ | 11 | 10½ | 9 | 8 | 8 | 8½ |
| Lincoln | 9 | 9½ | 9½ | 9 | 8½ | 8½ | 8 | 6 | 5½ | 6½ |
| Liverpool | 1/- | 1/- | 1/- | 11 | 11½ | 1/- | 10½ | 8 | 8 | 8 |
| Llanelly | 9½ | 9½ | 9½ | 8½ | 9 | 8½ | 8 | 5½ | 5½ | 5½ |
| London | 1/0½ | 1/0½ | 1/0½ | 1/0½ | — | 1/1 | 10 | 9 | 9 | 9 |
| Loughborough | 9 | 8½ | 9 | 9 | 9 | 8½ | 8½ | 5½ | 5½ | 6½ |
| Luton | 9½ | 9 | 9 | 8½ | 9 | 8½ | 7½ | 6½ | 6½ | 6½ |
| Maidstone | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 6 | 6 | 6 |
| Manchester | 11 | 11 | 11 | 11 | 10 | 11 | 10½ | 7½ | 7½ | 7½ |
| Mansfield | 8½ | 10 | 9½ | 8½ | — | 9½ | 9 | 7 | 7 | 7 |
| Merthyr Tydûl | 9½ | 9½ | 9½ | 9½ | 9½ | 9 | 8½ | 6½ | 6½ | 6½ |
| Middlesbrough | 10 | 10½ | 10½ | 10½ | 11 | 10½ | 9 | 7½ | 7½ | 8 |
| Newcastle-on-Tyne | 11 | 11 | 11 | 11 | 11 | 10½ | 10 | 7½ | 7½ | 7½ |
| Newport, Mon. | 10 | 10 | 10 | 10 | 8½ | 10 | 9½ | 7 | 7 | 7 |
| Northampton | 9 | 9 | 9 | 9 | 8½ | 9 | 8 | 6 | 6 | 6 |
| Norwich | 8½ | 8½ | 8½ | 8½ | 8 | 8½ | 7½ | 6 | 6 | 6 |
| Nottingham | 11 | 11 | 11 | 10½ | 10½ | 11 | 10 | 8½ | 8½ | 9 |
| Oldham | 11 | 11 | 11 | 10 | 10 | 10† | 9½ | 7½ | 7½ | 7½ |
| Oxford | 9½ | 9 | 9 | 9 | 8 | 9 | 8 | 6½ | 6½ | 6½ |
| Plymouth | 9* | 9* | 9* | 9* | 9 | 9* | 8½ | 6½* | 6½* | 6½* |
| Pontypridd | 9½ | 9½ | 9½ | 9½ | 9½ | 9½ | 8½ | 6½ | 6½ | 6½ |
| Portsmouth | 9½‡ | 9½‡ | 9½‡ | 9½‡ | 9½‡ | 8½‡ | 7½‡ | 7‡ | 7‡ | 7‡ |
| Preston | 10½ | 10½ | 10 | 9½ | 9½ | 10 | 9½ | 6 | 7 | 7½ |
| Reading | 9 | 9½ | 9½ | 10½ | — | 9½ | 8½ | 6½* | 6½* | 6½* |
| Rochdale | 10½ | 10½ | 10½ | 10 | 9½ | 10 | 9½ | 7½ | 7½ | 7½ |
| Rochester | 8 | 10 | 10 | 9 | 9 | 10 | 8½ | 7 | 7 | 7 |
| Rugby | 10 | 10 | 10 | 10½ | 8½ | 10 | 9 | 7 | 7 | 8 |
| St. Albans | 9 | 9 | 9 | 9–10 | 9 | 9–10 | 8 | 7 | 7 | 7 |
| St. Helens | 9 | 9½† | 10† | 9½ | 9½ | 10½ | 8 | 6 | 6½ | 6 |
| Scarborough | 9 | 9½ | 9 | 8½ | 8 | 9 | 8 | 7 | 7 | 7 |
| Sheffield | 10½ | 10† | 10½† | 9½ | 10 | 10½ | 9 | 7½ | 7½ | 7½ |
| Shrewsbury | 8½ | 9½ | 9½ | 9½ | — | 8½ | 7 | 6½ | 6½ | 6½ |
| Southampton | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 9½ | 7½ | 7½ | 7½ |
| Southend-on-Sea | 9 | 9 | 9 | 9 | P'cework | 9 | 7 | 6 | 6 | 6 |
| Southport | 11 | 10 | 10½ | 10 | 10 | 10½ | 10 | 7 | 7½ | 7½ |
| South Shields | 11 | 11 | 11 | 11 | 11 | 10½ | 10 | 7½ | 7½ | 7½ |
| Stockport | 11 | 10½ | 10½ | 10½ | 10½ | 10 | 9½ | 7 | 7½ | 7½ |
| Stockton-on-Tees | 10 | 10½ | 10½ | 10½ | 11 | 10½ | 9 | 7½ | 7½ | 8 |
| Stoke-on-Trent | 9 | 9½ | 9 | 9 | — | 8½ | 8½ | 6 | 6 | — |
| Stroud | 8 | 8 | 8 | 8 | 7½ | 7½ | 7½ | 6 | 6 | 6 |
| Sunderland | 11 | 11 | 10½ | 11 | 11 | 9½ | 9 | 7½ | 7½ | 7½ |
| Swansea | 10½ | 10½ | 10½ | 10½ | 10½ | 9 | 10 | 7½ | 7½ | 7½ |
| Taunton | 7 | 7 | 7 | 7 | — | 6 | 6½ | 4½ | 4½ | 4½ |
| Torquay | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 6 |
| Wakefield | 9½ | 10 | 9 | 9½ | 8½ | 9 | 9 | 7½ | 7½ | 7½ |
| Walsall | 10½ | 10 | 10 | 10 | 9½ | 10 | 8½ | 7½ | 7½ | 7½ |
| Warrington | 8½ | 10½ | 10½ | 10½ | 8½ | 10½ | 9½ | 6½ | 6½ | 6½ |
| West Bromwich | 11 | 11 | 10 | 10½ | — | 10 | 8 | 8 | 8 | 8 |
| Wigan | 10½ | 11 | 10 | 10 | 9½ | 10½ | 9½ | 7 | 7 | 7 |
| Windsor | 9 | 9 | 9 | 10 | — | 9 | — | 6 | 6 | 6 |
| Wolverhampton | 10½ | 10½ | 10½ | 11 | 8 | 10 | 9 | 7½ | 7½ | 7½ |
| Worcester | 8½ | 9½ | 9½ | 9½ | 9 | 9½ | 8 | 6½ | 6½ | 6½ |
| York | 9½ | 9½ | 9½ | 9½ | 10 | 9½ | 8½ | 7 | 7 | 7 |

The Mason's rate given is for bankers; fixers usually ½d. per hour extra.

*War bonus of 2s. per week granted. † War bonus of 3s. per week granted. ‡ War bonus of 2s. 6d. per week granted.

# List of Competitions, Contracts, etc.

**For some contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this number:** Competitions, —; Contracts, —; Public Appointments, —; Auction Sales, xxx. Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

## Contracts.

### BUILDING AND PAINTING.

***The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.***

SEPTEMBER 30.—**Brighouse.**—DINING HALL, ETC.—Erection of a dining hall to accommodate 800 workpeople, cooking kitchen, recreation-rooms, storerooms, offices, etc., at the Woodhouse Works, Brighouse, for Messrs. J. Blakebrough & Sons. Names to Woodhouse Works. Messrs. Sharp & Waller, architects, 23, Bradford-road, Brighouse.

OCTOBER 2.—**Askern (Doncaster).**—SHED, ETC.—For the erection of a brick tool shed and boundary walls which will form part of the future caretaker's house at the new burial ground in Church Field-road, Askern, for the P.C. Plans, etc., of Mr. J. Simmons, architect, 10, High-street, Doncaster.

OCTOBER 2.—**Tobercurry (Ireland).**—PAINTING, ETC.—For painting the dispensary medical officer's residence at Banada, and for resetting ridge and hip tiles on the dispensary medical officer's residence at Tobercurry, for the Guardians. Specification of Mr. W. V. Donohoe, Clerk, Board-room, Tobercurry.

OCTOBER 2.—**Wigan.**—AMBULANCE SHED.—For the erection of a motor ambulance shed at the Whelley Sanatorium. Quantities of Mr. A. T. Gooseman, Borough Engineer, King-street West, Wigan.

OCTOBER 2.—**Winchester.**—PAINTING.—For external painting of the Royal Hants County Hospital, Winchester. Bills of quantities of the architect, Mr. H. L. G. Hill, 11, Southgate-street, Winchester. Deposit, £1 1s. Specification may be seen at the Hospital.

OCTOBER 9.—**Selby.**—COTTAGES.—For the erection of twenty-two cottages on land in Kitchener-street, Selby, for the U.D.C. Plans, etc., of Mr. Bruce Gray, C.E., F.R.S. (Edin.), Council Chambers, Selby.

OCTOBER 12.—**London.**—PAINTING, ETC.—For painting and cleaning at the Guardians' Offices and Fulham Military Hospital, Fulham Palace-road, W., for the Fulham B.C. Specification, etc., of Mr. E. J. Mott, Clerk.

NO DATE.—**Blackpool.**—PAINTING, ETC.—Messrs. Hallmark & Gill, Ltd., require shop, etc., painting outside. Specification at 21, Church-street, Blackpool.

### FURNITURE, MATERIALS, etc.

OCTOBER 2.—**London.**—CABINETS, ETC.—Supply to the Commissioners of H.M. Works, etc., of (*a*) 700 card index cabinets; (*b*) 2,000 Admiralty, typists', and collapsible tables. Forms of tender, etc., of the Controller of Supplies, H.M. Office of Works, King Charles-street, Westminster, S.W.

OCTOBER 4.—**Aberdare.**—FURNITURE.—The Aberdare and District General Hospital Committee require tenders for furniture, etc. Forms of tender of Mr. A. W. Humphreys, 50, Cwmaman-road, Godreaman, Aberdare.

### ENGINEERING, IRON, AND STEEL.

OCTOBER 2.—**Tilbury.**—REFUSE DESTRUCTOR.—For the construction of a destructor, together with auxiliary plant, for the U.D.C. Specification, etc., from Mr. S. A. Hill-Willis, A.M.Inst.C.E.I., Engineer and Surveyor to the Council, Council Offices, Dock-road, Tilbury, on production of a receipt from the Council's Accountant for a deposit of £1 1s.

OCTOBER 9.—**Manchester.**—PUMP.—Supply to the Corporation Electricity Committee at their Bloom-street generating station of one steam turbine-driven boiler feed pump. Specification, etc., of Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester. Deposit, £1 1s.

DECEMBER 11.—**Melbourne.**—PLANT.—For the supply, delivery, and erection in Melbourne of a coal transporter plant. Tender form, etc., of Messrs. McIlwraith, McEacharn, & Co. Ppty., Ltd., Billiter-square-buildings, London, E.C. Deposit, £1 1s.

### ROAD, SANITARY, AND WATER WORKS.

SEPTEMBER 30.—**Skipton.**—SEWER EXTENSION.—For the construction of about 760 lineal yds. of 9-in. sewer, together with the necessary manholes, etc., for the R.D.C. Plan, etc., from Mr. A. Rodwell, the Council's Engineer, 16, Gargrave-road, Skipton.

OCTOBER 2.—**Beddington and Wallington.**—STEAM WAGONS.—Supply to the U.D.C. of steam wagons. Form of tender, etc., from Mr. S. F. R. Carter, A.M.Inst.C.E., Engineer and Surveyor to the Council, Council Offices, Wallington, Surrey.

OCTOBER 4.—**Hove.**—BROKEN STONE.—For supplying broken stone for road metalling, for one year from October 1, 1916. Particulars and form of tender at the Borough Surveyor's Office.

OCTOBER 4.—**Leiston-cum-Sizewell.**—GRANITE.—Supply to the U.D.C. of 175 tons of 2-in. and 1¼-in. granite. Mr. Harold A. Mullens, Clerk to the Council, Leiston.

OCTOBER 16.—**Sheerness.**—MATERIAL.—Supply to the U.D.C. of 100 tons of 2-in. granite (Leicester), 100 tons of 1½-in. granite (Leicester), 100 tons of 2-in. Kentish ragstone (free from Hassock), 200 yds. of good clean hoggin for binding purposes, free from clay and all other defects. Tender forms from Mr. Vincent H. Stallon, Clerk of the Council, Council Offices, Sheerness.

OCTOBER 25.—**Beaconsfield.**—GRANITE.—Supply to the U.D.C. of 1,000 tons (more or less) of 2½-in. and 1½-in. broken granite. Mr. H. Gilbert Hogarth, Clerk, Old Bank House, Beaconsfield.

**[Those with an asterisk (*) are advertised in this issue.]**

## NEW GOVERNMENT CONTRACTS.

### War Office.

*Apparatus, Drain Cleaning.*—Cakebread, Robey, & Co., 225, High-road, Wood Green, N.; A. Ewen, 4, St. James's-road, Victoria Park, E.; Marshall Bros., 288, Icknield-street, Birmingham.

*Barrows.*—Acme Patent Ladder Company, 364, Garratt-lane, Earlsfield, S.W.; J. Ashworth & Co., Trafford Park, Manchester; Colley Bros., Ltd., Oulton Broad, Lowestoft; W. S. Laycock, Ltd., Victoria Works, Millhouse, Sheffield; F. Parker & Co., 22, West End-lane, N.W.; C. R. Pettit & Son, Bridge-street, Thrapston; W. J. Philpott, 131, Waddon New-road, West Croydon.

*Benches, Circular Saw.*—J. McDowall & Sons, Walkinshaw Foundry, Johnston, N.B.; Marshall, Sons, & Co., Ltd., Gainsborough.

*Benches, Rack Saw.*—J. Pickles & Son, Hebden Bridge, Yorks.

*Boilers and Fittings.*—Birmingham Advertising Tablet Company, Ltd., National Works, Smethwick, Birmingham; Clayton & Shuttleworth, Ltd., Stamp End Works, Lincoln; Cochran & Co. (Annan), Ltd., Annan, N.B.; Fisher & Ludlow, Ltd., Rea-street, Birmingham; Musgrove & Green, Ltd., Bromsgrove-street, Birmingham; Ogston Motor Company, Ltd., Southfield-road, Acton, W.; G. W. Pearce & Sons, Ltd., Chester-street, Birmingham; W. H. Spencer & Co., Hitchin, Herts.

*Bolts and Nuts, etc.*—Bayliss, Jones, & Bayliss, Wolverhampton; Blakemore & Co., Ltd., Bag-lane, Atherton, Manchester; Bullers, Ltd., Tipton, Staffs; Butler & Spragg, Ltd., Cambridge-street, Birmingham; F. W. Cotterill, Ltd., Atlas Works, Darlaston; Guest, Keen, & Nettlefolds, Ltd., London Works, Birmingham; Hampton & Dean, King's-hill, Wednesbury; Horton & Sons, Ltd., New Alma Works, Darlaston; A. E. Jenks & Cattell, Heath Town, Wolverhampton; Nuts and Bolts (Darlaston), Ltd., Foster-street, Darlaston; T. Pittaway & Sons, Blackheath, Birmingham; Steel Nut and J. Hampton, Ltd., Wednesbury; J. Wiley & Sons, Ltd., Eagle Works, Darlaston.

*Granite, Broken* (Term Contract).—Midland Quarry Company, Ltd., Tuttle-hill Quarries, Nuneaton.

*Helves, Pickaxe, etc.*—Appleton Saw Mills, Ltd., Halton View-road, Widnes; J. Ashworth & Co., Trafford Park, Manchester; R. Burley & Sons, Ltd., Fairley-street, Govan; G. Dickie & Son, Chester-street, Birkenhead; R. Groom, Son, & Co., Ltd., Wellington, Salop; J. Nicholls & Sons, All Saints'-road, Wolverhampton; J. Owen & Sons, Ltd., Stanley-road, Liverpool; J. Parker & Sons, Green-lane, Birchills, Walsall; J. Sadd & Sons, Ltd., The Wharf, Maldon; W. M. Winton & Co., Ltd., Hemp-row, Chatham-street, Walworth, S.E.

*Huts, Steel-Framed.*—J. B. Corrie & Co., 15, Victoria-street, S.W.

*Mixers, Concrete.*—Winget, Ltd., 25, Victoria-street, Westminster, S.W.

*Plant, Welding, etc.*—Imperial Light, Ltd., New-road, Battersea, S.W.

*Steelwork for Huts.*—Bayliss, Jones, & Bayliss, Ltd., Victoria Works, Wolverhampton; Braithwaite & Kirk, Crown Bridge Works, West Bromwich; F. Morton & Co., Ltd., Garston, Liverpool; D. Rowell & Co., Ltd., 33, Old Queen-street, Westminster, S.W.

*Stonebreakers.*—W. H. Baxter, Ltd., Leeds; Robey & Co., Ltd., Globe Works, Lincoln.

*Tanks.*—Baldwin's, Ltd., 35, Orchard-place, Blackwall, E.; Brown, Lennox, & Co. (London), Ltd., Millwall, E.; T. Piggott & Co., Ltd., Atlas Works, Birmingham; S. M. Wilmot & Co., Ltd., St. Philip's Marsh, Bristol.

*Wire, Iron and Steel.*—Dorman, Long, & Co., Ltd., Cleveland Wire Mills, Middlesbrough; Guest, Keen, & Nettlefolds, Ltd., Coverack-road, Newport, Mon.; Rylands Bros., Ltd., Warrington; J. Shipman & Co., Ltd., Attercliffe, Sheffield.

### India Office—Store Department.

*Cement.*—Associated Portland Cement Manufacturers, Lloyd's-avenue, E.C.

*Paint.*—Fenner & Alder, 120, Fenchurch-street, E.C.

*Steel Plates.*—J. Dunlop & Co., 7, Royal Bank-place, Glasgow; R. Stephenson & Co., Darlington.

*Steel Sheets.*—F. Braby & Co., 110, Cannon-street, E.C.

### H.M. Office of Works.

*Building Works.*—Admiralty and War Office, St. James's Park, S.W., erection of an extension to the temporary building: Jas Smith & Sons (Norwood), Ltd., Junction Works, South Norwood, S.E.; Buckingham Palace, alterations to servants' quarters: Holloway Bros. (London), Ltd., Bridge Wharf, Grosvenor-road, S.W.; Grantham temporary sorting office, erection: Bosworth & Lowe, Haydn-road, Nottingham; National Physical Laboratory, extension: Jas. Smith & Sons (Norwood), Ltd., Junction Works, South Norwood, S.E.; wool offices, 52, Leeds-road, Bradford, alterations, etc.: Wilkinson & Dawson, Bowland-street, Bradford.

*Engineering Works.*—Admiralty Buildings, Block IV., Whitehall, S.W.: installation of three boilers, centrifugal pump and motor, etc.: Colley, Meikle, & Co., Avenue-chambers, 4, Vernon-place, Southampton-row, W.C.; Cardiff district, engineering labour in day-work: Friend, Wintle, & Co., 8, Westgate-street, Cardiff.

# PRICES CURRENT OF MATERIALS.

**[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.]**

*Several prices have been revised since last issue.*—ED.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

## BRICKS, &c.

| Per 1000 Alongside, in River Thames. | £ s. d. |
|---|---|
| Best Stocks | 2 0 0 |
| Picked Stocks for Facings | 2 12 0 |

| Per 1000, Delivered at Railway Depôt, London. | £ s. d. | | £ s. d. |
|---|---|---|---|
| Flettons | 1 13 0 | Best Blue Pressed Staffordshire | 5 7 0 |
| Best Fareham Red | 3 12 0 | Do. Bullnose | 5 12 0 |
| Best Red Pressed Ruabon Facing | 5 5 0 | Best Stourbridge Fire Bricks | 6 17 6 |

| GLAZED BRICKS— | | | |
|---|---|---|---|
| Best White, Ivory, and Salt Glazed Stretchers | 13 7 6 | D'ble Str'tch'rs | 18 17 6 |
| Headers | 12 17 6 | Double Headers | 15 17 6 |
| Quoins, Bullnose and 4½ in. Flats | 16 17 6 | One Side and two Ends | 19 17 6 |
| | | Two Sides and one End | 20 17 6 |
| | | Splays and Squints | 18 7 6 |

Second Quality £1 per 1,000 less than best.

| | s. d. | |
|---|---|---|
| Thames Ballast | 8 3 | per yard, delivered. |
| Thames and Pit Sand | 9 6 | " " " |
| Best Washed Sand | 10 0 | " " " |
| ¾ in. Shingle for Ferro-Concrete | 8 6 | " " " |

| Per ton, delivered. | £ s. d. | | £ s. d. |
|---|---|---|---|
| Best Portland Cement | 2 5 0 | .. | 2 8 0 |

Do. £2 1s. alongside in 80-ton lots.
Ferrocrete 2s. 6d. per ton extra on above.
Best Ground Blue Lias Lime .. 1 5 6 at rly. depôt.
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.
Grey Stone Lime ..... 18s. 0d. per yard delivered.
Stourbridge Fireclay in s'cks 35s. 0d. per ton at rly. dpt.

## STONE.

| BATH STONE—delivered in railway trucks at | s. d. |
|---|---|
| Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube | 1 7 |
| Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube | 1 8½ |
| Do. do. delivered on road waggons at Nine Elms Depôt | 1 9½ |

PORTLAND STONE—

| Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Westbourne Park, G.W.R., South Lambeth, G.W.R., or Nine Elms, or L. & S.W.R., per ft. cube | 2 5½ |
|---|---|
| Do. do. delivered on road waggons at Pimlico Wharf or Nine Elms Depôts, per ft. cube | 2 6½ |

White basebed, 2d. per ft. cube extra.

| RANDOM BLOCKS—Per Ft. Cube, delivered at Rly. Depôt. | s. d. | | s. d. |
|---|---|---|---|
| Ancaster in blocks | 2 0 | Closeburn Red | |
| Beer in blocks | 1 7½ | Freestone | 2 2 |
| Grinshill in blocks | 2 4 | Red and White Mansfield random block | 2 9 |
| Darley Dale in blocks | 2 5 | Yellow Magnesian Limestone do. do. | 3 3 |

YORK STONE—*Robin Hood Quality.*

| Per Ft. Cube, Delivered at Raiway Depôt. | s. d. |
|---|---|
| Scappled random blocks | 3 4 |

Per Ft. Super. Delivered at Railway Depôt.

| | |
|---|---|
| 6 in. sawn two sides landings to sizes (under 40 ft. super.) | 2 5 |
| 6 in. rubbed two sides, ditto | 2 8 |
| 3 in. sawn two sides slabs (random sizes) | 1 0½ |
| 2 in. to 2½ in. sawn one side slabs (random sizes) | 0 8½ |
| 1½ in. to 2 in. ditto, ditto | 0 6½ |

HARD YORK—

| Per Ft. Cube, Delivered at Railway Depôt. | |
|---|---|
| Scappled random blocks | 3 0 |

Per Ft. Super., Delivered at Railway Depôt.

| | |
|---|---|
| 6 in. sawn two sides landing to sizes (under 40 ft. super.) | 2 3 |
| 6 in. rubbed two sides ditto | 2 7 |
| 3 in. sawn two sides slabs (random sizes) | 1 0 |
| 2 in. self-faced random flags | 0 5 |

## TILES.

| | Per 1,000 f.o.r. London. £ s. d. |
|---|---|
| Best machine-made tiles or hand-made sand-faced tiles from either Broseley or Staffordshire district | 2 12 6 |
| Ornamental ditto | 2 15 0 |
| Hip and valley tiles (per dozen) | 0 5 6 |

## SLATES.

| | Per 1,000 of 1,200 f.o.r. London. £ s. d. |
|---|---|
| Best Blue Bangor Slates, 20 by 10 | 12 0 0 |
| First quality " " | 11 15 0 |
| " " 16 by 8 | 6 0 0 |
| Best Blue Portmadoc, 20 by 10 | 11 17 6 |
| First quality " " | 11 7 6 |
| " " 16 by 8 | 6 0 0 |

## WOOD.

| BEST BUILDING REDWOOD. Imported sizes. | Nominal. Per standard. £ s. d. | | £ s. d. |
|---|---|---|---|
| Deals: 4 in. by 12 in., 4 in. by 11 in., 3 in. by 11 in., 4 in. by 9 in., and 2 in. by 11 in. | 35 0 0 | .. | 36 0 0 |
| 9 in. by 9 in., 2½ in. by 9 in., and 2 in. by 9 in. | 34 0 0 | .. | 35 0 0 |

## WOOD (*Continued*).

| BEST BUILDING REDWOOD. | Per standard. £ s. d. | | £ s. d. |
|---|---|---|---|
| Battens: 2 in., 2½ in., and 3 in. by 8 in. ... 2 in., 2½ in., and 3 in. by 7 in. ... 2 in., 2½ in., and 3 in. by 6 in. | 32 0 0 | .. | 33 0 0 |
| Scantlings: 2 in. by 3 in., 2 in. by 3½ in., 2 in. by 4 in., 2 in. by 4½ in. .... 3 in. by 4 in., and 3 in. by 4½ in. | | | |
| Boards: 1 in., 1¼ in., and 1½ in. by 6 in. and 7 in. | 0 10 0 | | more than battens. |
| ¾ in. | 1 0 0 | | |
| Seconds | 1 0 0 | | less than best |
| Best Middling Dantzic and Memel Fir Timber Logs (average specification) .. | Per load of 50 ft. cube. 10 0 0 | .. | — |
| Stocks very limited. | | | |
| Sawn pitch pine logs (about 35 cu. ft. average) | Per load. 14 0 0 | .. | 15 0 0 |
| Do. 6 in. to 10 in. | 12 0 0 | .. | 13 0 0 |
| | Per standard. | | |
| Best Pitch Pine Deals | 36 0 0 | .. | 46 0 0 |
| Under 2 in. thick | 0 10 0 | extra. | |

| JOINERS' WOOD. | | | |
|---|---|---|---|
| White Sea First Quality Red: 4 in. by 11 in. | 43 0 0 | .. | 44 0 0 |
| 3 in. by 11 in., and 2 in. by 11 in. | 42 0 0 | .. | 43 0 0 |
| 4 in. by 9 in. | 38 0 0 | .. | 39 0 0 |
| 3 in. by 9 in., and 2½ in. by 9 in. | 37 0 0 | .. | 38 0 0 |
| 9 in. by 11 in. boards | 1 0 0 | .. | more than deals. |
| 7 in. and 8 in. battens | 34 0 0 | .. | 35 0 0 |
| 7 in. and 8 in. boards | 1 0 0 | .. | more than battens. |
| Archangel White Deals— Best 3 in. by 9 in. and 10 in. and 11 in. | 40 0 0 | .. | 44 0 0 |
| Seconds, do. | 2 0 0 | | less than best. |
| U.S. Battens | 31 0 0 | .. | 33 0 0 |
| Prepared Floorings and Matchings, Seconds Swedish Red and equal— | Per square actual. | | |
| 1¼ in. by 6½ in. planed and shot | 2 2 0 | .. | 2 3 0 |
| 1¼ in. by 6½ in. planed and matched | 2 3 0 | .. | 2 4 0 |
| 1 in. by 6½ in. planed and shot | 1 10 0 | .. | 1 13 0 |
| 1 in. by 6½ in. planed and matched | 1 11 0 | .. | 1 12 0 |
| ¾ in. by 6½ in. planed, matched, and beaded, or V jointed | 1 6 0 | .. | 1 8 0 |
| 1 in. by 6½ in. do. | 1 10 6 | .. | 1 12 0 |
| Columbian or Oregon Pine, best quality | Per standard. 50 0 0 | .. | 55 0 0 |
| Yellow Pine—First regular sizes | 57 0 0 | upwards. | |
| Oddments | 39 0 0 | " | |
| Seconds, regular sizes | 43 10 0 | " | |
| Oddments | 37 10 0 | " | |
| Kauri Pine—Planks per ft. cube | 0 8 0 | .. | — |
| Wainscot Oak Logs, per ft. cube | 0 10 6 | .. | 0 12 6 |
| Dry Wainscot Oak, per ft. super, as inch. | 0 1 0 | .. | 0 1 3 |
| ¾ in. do. do. | 0 0 10 | .. | 0 1 0 |
| Dry Mahogany — Honduras, Tabasco, per ft. super, as inch | 0 1 0 | .. | 0 1 4 |
| Cuba, Mahogany | 0 1 6 | .. | 0 2 6 |
| Dry Walnut, American, per ft. super, as inch | 0 1 0 | .. | 0 1 3 |
| French, "Italian," Walnut | 0 1 0 | .. | 0 1 6 |
| Teak, per load (Rangoon or Moulmein) | 26 0 0 | .. | 30 0 0 |
| Do. do. (Java) | 24 0 0 | .. | 26 0 0 |
| American Whitewood planks, per ft. cube | 0 8 6 | .. | 0 9 0 |
| Glue, per cwt. | 3 15 0 | .. | 3 19 0 |

## METALS.

JOISTS, GIRDERS, &c.

| | In London or Railway Vans, £ s. d. | | delivered per ton. £ s. d. |
|---|---|---|---|
| Rolled Steel Joists, ordinary sections, basis price | 20 0 0 | .. | 21 0 0 |
| Plain Compound Girders, ordinary sections | 22 0 0 | .. | 23 0 0 |
| Plain Compound Stanchions | 23 0 0 | .. | 24 10 0 |
| Angles, Tees, and Channels, ordinary sections | 20 10 0 | .. | 21 10 0 |
| Flitch Plates | 20 10 0 | .. | 21 10 0 |
| Cast Iron Columns and Stanchions, plain ordinary patterns | 13 10 0 | .. | 14 0 0 |

(Turning extra.)

WROUGHT-IRON TUBES AND FITTINGS—
Discounts off Association Prices.

| | Tubes. Per Cent. | Fittings. Per Cent. |
|---|---|---|
| Gas at works | 47½ | 50 |
| Water " | 42½ | 47½ |
| Steam " | 37½ | 45 |
| Galvanised gas at works | 30 | 42½ |
| " water " | 21½ | 40 |
| " steam " | 15 | 37½ |

L.C.C. SOIL PIPE— London Prices.

| | Pipes Coated. s. d. | | Bends. s. d. | | Branches. s. d. |
|---|---|---|---|---|---|
| 2 in. | 2 7 | .... | 1 10 | .... | 2 2 |
| 2½ in. | 3 6 | .... | 2 0 | .... | 2 9 |
| 3 in. | 3 9½ | .... | 2 2 | .... | 3 4 |
| 3½ in. | 4 2 | .... | 2 9 | .... | 3 10 |
| 4 in. | 4 6½ | .... | 3 1 | .... | 4 5 |

RAIN-WATER PIPES, ETC.— London Prices.

| | Pipe. s. d. | | Bends. s. d. | | Branches. s. d. |
|---|---|---|---|---|---|
| 2 in. | 1 10½ | .... | 1 0 | .... | 1 4 |
| 2½ in. | 2 1 | .... | 1 2 | .... | 1 8 |
| 3 in. | 2 4½ | .... | 1 5 | .... | 2 2 |
| 3½ in. | 2 11½ | .... | 1 9 | .... | 2 7 |
| 4 in. | 3 2 | .... | 2 1 | .... | 3 1 |

## METALS (*Continued*).

L.C.C. DRAIN PIPES— London Prices.
4 in., 4s. 6d. .. 5 in., 5s. 6d. .. 6 in., 6s. 6d.

| | Per ton, in London. £ s. d. | | £ s. d. |
|---|---|---|---|
| IRON— | | | |
| Common Bars | 16 0 0 | .. | — |
| Staffordshire Crown Bars, good merchant quality | 16 0 0 | .. | 17 0 0 |
| Staffordshire "Marked Bars" | 17 10 0 | .. | 18 0 0 |
| Mild Steel Bars | 18 0 0 | .. | 18 10 0 |
| Steel Bars, Ferro-Concrete quality, £18 basis price. | | | |
| Hoop Iron, basis price | 20 0 0 | .. | 20 10 0 |
| " " Galvanised | 33 0 0 | .. | — |
| (* And upwards, according to size and gauge.) | | | |
| Sheet Iron Black— | | | |
| Ordinary sizes to 20 g. | 21 0 0 | .. | 21 10 0 |
| " " 24 g. | 22 0 0 | .. | 22 10 0 |
| " " 26 g. | 23 0 0 | .. | 23 10 0 |
| Sheet Iron, Galvanised flat, ordinary quality— | | | |
| Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. | 31 0 0 | .. | — |
| Ordinary sizes to 22 g. and 24 g. | 31 0 0 | .. | 31 10 0 |
| Ordinary sizes to 26 g. | 34 0 0 | .. | — |
| Sheet Iron, Galvanised, flat, best quality— | | | |
| Ordinary sizes to 20 g. | 34 0 0 | .. | — |
| " " 22 g. and 24 g. | 34 10 0 | .. | — |
| Ordinary sizes to 26 g. | 37 10 0 | .. | — |
| Galvanised Corrugated Sheets— | | | |
| Ordinary sizes, 6 ft. to 8 ft. 20 g. | 29 0 0 | .. | — |
| Ordinary sizes, 22 g. & 24 g. | 29 10 0 | .. | — |
| Ordinary sizes, 26 g | 30 0 0 | .. | — |
| Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker | 23 10 0 | .. | — |
| Best Soft Steel Sheets, 22 g. and 24 g. | 23 15 0 | .. | — |
| Best Soft Steel Sheets, 26 g. | 25 10 0 | .. | — |
| Cut Nails, 3 in. to 6 in. | 24 0 0 | .. | 25 0 0 |
| (Under 3 in., usual trade extras.) | | | |

## LEAD, &c.

Delivered in London.

| | £ s. d. | | |
|---|---|---|---|
| LEAD—Sheet, English, 4 lb. and up | 39 0 0 | .. | — |
| Pipe in coils | 39 10 0 | .. | — |
| Soil pipe | 42 10 0 | .. | — |
| Compo pipe | 42 10 0 | .. | — |
| NOTE—Country delivery, 20s. per ton extra; lots under 5 cwt., 1s. 6d. per cwt. extra. | | | |
| COPPER— | | | |
| Strong Sheet per lb. | 0 1 6 | .. | — |
| Thin " " | 0 1 8 | .. | — |
| Copper nails " | 0 1 6 | .. | — |
| Copper wire " | 0 1 8 | .. | — |
| BRASS— | | | |
| Strong Sheet " | 0 1 6 | .. | — |
| Thin " " | 0 1 8 | .. | — |
| TIN—English Ingots " | 0 1 9 | .. | — |
| SOLDER—Plumbers' " | 0 0 10 | .. | — |
| Tinmen's " | 0 1 1 | .. | — |
| Blowpipe " | 0 1 3 | .. | — |

## GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

| | Per Ft. | | Per Ft. |
|---|---|---|---|
| 15 oz. fourths | 4d. | 26 oz. thirds | 6½d. |
| " thirds | 4½d. | 32 oz. fourths | 6¾d. |
| 21 oz. fourths | 5d. | " thirds | 8d. |
| " thirds | 5½d. | Fluted Sheet, 15 oz. | 5½d. |
| 26 oz. fourths | 5½d. | " 21 oz. | 6½d. |

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

| | Per Ft. |
|---|---|
| ⅛ Rolled plate | 4d. |
| 3/16 Rough rolled and rough cast plate | 4½d. |
| ¼ Rough rolled and rough cast plate | 4¾d. |
| Figured Rolled, Oxford Rolled, Baltic, Oceanic, Arctic Muffled, and "Stippolyte," white | 4¾d. |
| Ditto, tinted | 6½d. |
| Rolled Sheet | 4½d. |

## PAINTS, &c.

| | | £ s. d. |
|---|---|---|
| Raw Linseed Oil in pipes per gallon | | 0 3 5 |
| " " " in barrels | " | 0 3 6 |
| " " " in drums | " | 0 3 9 |
| Boiled " " in barrels | " | 0 3 8 |
| " " " in drums | " | 0 4 0 |
| Turpentine in barrels | " | 0 3 6 |
| " in drums | " | 0 3 9 |
| Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.) | | 56 0 0 |
| Red Lead, Dry | per ton | 58 0 0 |
| Best Linseed Oil Putty | per cwt. | 0 11 0 |
| Stockholm Tar | per barrel | 4 5 0 |
| Filocol | per cwt. | 0 9 6 |

GENUINE WHITE LEAD PAINT—
"Blackfriars," "Nine Elms," "Park," and other best brands (in 14 lb. tins) not less than 5 cwt. lots ..... per ton delivered 68 0 0

## VARNISHES, &c.

| | Per gallon. £ s. d. |
|---|---|
| Fine Pale Oak Varnish | 0 8 0 |
| Pale Copal Oak | 0 10 6 |
| Superfine Pale Elastic Oak | 0 12 6 |
| Fine Extra Hard Church Oak | 0 10 0 |
| Superfine Hard-drying Oak, for seats of Churches | 0 14 6 |
| Fine Elastic Carriage | 0 12 9 |
| Superfine Pale Elastic Carriage | 0 16 0 |
| Fine Pale Maple | 0 10 0 |
| Finest Pale Durable Copal | 0 18 6 |
| Extra Pale French Oil | 1 1 0 |
| Eggshell Flating Varnish | 0 18 0 |
| White Pale Enamel | 1 4 0 |
| Extra Pale Paper | 0 12 0 |
| Best Japan Gold Size | 0 10 0 |
| Best Black Japan | 0 16 0 |
| Oak and Mahogany Stain | 0 9 0 |
| Brunswick Black | 0 8 0 |
| Berlin Black | 0 16 0 |
| Knotting | 0 13 0 |
| French and Brush Polish | 0 13 0 |

## TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 2 *p.m. on Wednesday.*

* Denotes *accepted.* † Denotes *provisionally accepted.*

KIRKCALDY.—Supply of materials for and the erection of a wire fence near the new sanatorium off Dunnikier, for the Town Council. Mr. J. L. Lumsden, Burgh Surveyor:—

| | |
|---|---|
| A. Gray & Co. | £84 0 |
| J. Smart | 56 0 |
| Thomson Bros. | 52 10 |
| H. Carmichael, 38, Townsend-crescent* | 52 10 |

[All of Kirkcaldy.]

KIRKCALDY.—For laying a quantity of granolithic pavement at the west end of Loughborough-road, for the Town Council. Mr. J. L. Lumsden, Burgh Surveyor. Quantities by Burgh Surveyor:—

| | |
|---|---|
| T. Forrester | £26 13 |
| R. F. Page | 22 11 |
| A. Hutchison & Sons* | 20 10 |

[All of Kirkcaldy.]

LONDON.—Accepted by the Westminster City Council for supply of materials:—
Ballast and sand.—H. Sabey & Co., six months.
Carriageway repairs (wood pavement), subject to war and strike clause and to the company agreeing to a six months' contract.—Acme Flooring and Paving Co. (1904), Ltd., six months.
Carriageway repairs (wood pavement). Items 5, 6, 7, and 8 (old work only), and 10 and 11 (new work), subject to war and strike clause.—Improved Wood Pavement Co., Ltd., six months.
Gullies (stoneware) construction.—J. Mowlem & Co., Ltd., six months.
Painters' materials and miscellaneous oils.—J. Tillyer & Co., six months.
Painters' materials and miscellaneous oils.—How, Frank, & Co., twelve months.
Stoneware goods, subject to strike and lock-out clause.—Doulton & Co., Ltd., six months.

LONDON.—For renewal of defective parts of washing-machine at the Latchmere-road Washhouses, for the Battersea Borough Council:—
Tullis & Co., Ltd.‡ ..... £72
‡ Recommended for acceptance.

LONDON—Supply of about 90,000 best stock bricks required for the erection of the electricity sub-station, Nine Elms, S.W., for the Battersea Borough Council:—
Dawson & Co., Ltd., Mendip Wharf, Battersea,* 47s. per 1,000 delivered on site at Nine Elms.

LONDON.—For repaving portions of Shoreditch High-street (west side from London County and Westminster Bank to Bateman's-row) and Great Eastern-street (south side from No. 61 to 93), for the Shoreditch Borough Council:—
W. Griffiths & Co., Ltd., Hamilton House, Bishopsgate, E.C.,‡ 19s. per yard superficial.
Improved Wood Pavement Co., Ltd., 19s. 3d.
Acme Flooring and Paving Co., Ltd., 20s. 6d.
‡Recommended for acceptance.

SHAFTESBURY.—For work in School-lane, for the Rural District Council:—
H. A. Martin* ..... £35 7 6

## PATENTS.

APPLICATIONS PUBLISHED.*

12,716 of 1915.—C. D. Monninger, Ltd., John Walsh, and Sam Barlow: Mortising machines.

13,567 of 1915.—George Rudolph Grubb and George Seymour Higginson: Apparatus for desiccating and circulating air.

13,667 of 1915.—John George Kirtley and Albert Cowper: Ash-bins, refuse receptacles, and the like.

## TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to THE BUILDER LTD., and *not* to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

* These applications are now in the stage in which opposition to the grant of Patents upon them may be made.

## NEW COMPANIES.

THE undermentioned particulars of new companies recently registered are taken from the Daily Register compiled by Messrs. Jordan & Sons, Ltd., Company Registration Agents, Chancery-lane, W.C.:—

W. COX (MANSFIELD), LTD. (144,844). Registered September 13. To carry on business of plumbers, painters, glaziers, agents for and dealers in bricks, tiles, cement, hardware, and general building requisites. Nominal capital, £500 in 500 £1 shares.

RICE & HARTING, LTD. (144,855). Registered September 14. To carry on the business of builders, timber merchants, woodworkers, metalworkers, etc. Nominal capital, £3,000 in 3,000 £1 shares.

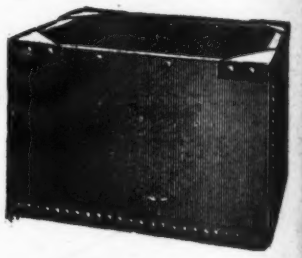
## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 19s. per annum, with delivery *by Friday Morning's Post* in London and its suburbs.

To Canada, post free, 21s. 8d. per annum; and to all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

Remittances (payable to THE BUILDER LTD.) should be addressed to 4, Catherine-street, Aldwych, London, W.C.

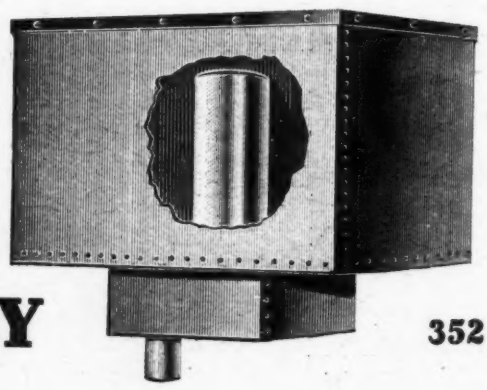
AUSTRIAN and RIGA.
FIRST-CLASS, MILD GRAINED, DRY
WAINSCOT OAK.
J. GLIKSTEN & SON, Ltd.,
Carpenters' Road, Stratford, E.
*Telegrams:* "Gliksten, Strat, London." *Telephone No.:* Eastern 3771 (5 lines).

CISTERNS

ANY SIZE.
ANY GAUGE.
THE
London Galvanised Iron Co.
27, Wharf Road, City Road, N.
Telephone—NORTH 2783 (2 lines).

Austrian
RUSSIAN and JAPANESE
PRIME DRY
WAINSCOT Oak
SYDNEY PRIDAY,
KING WILLIAM HOUSE, 2a, EASTCHEAP, LONDON, E.C.
Depot: Wainscot Sheds, Millwall, E. *T.N.: Avenue 667.*

J. J. ETRIDGE, Jr. LTD.
SLATE MERCHANTS.
EXPERTS IN
SLATING, TILING.
AIR RAID REPAIRS.
Telephone: Avenue 4940 (two lines), or write—
Bethnal Green Slate Works,
BETHNAL GREEN, LONDON, E.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Co. (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to Forth Bridge Co. T.N. 2644 Central.

BRABY'S Automatic Flushing Tanks.
SIMPLE.

RELIABLE.
FRED^K. BRABY & CO., LTD.,
352 to 364, EUSTON ROAD, LONDON, N.W.